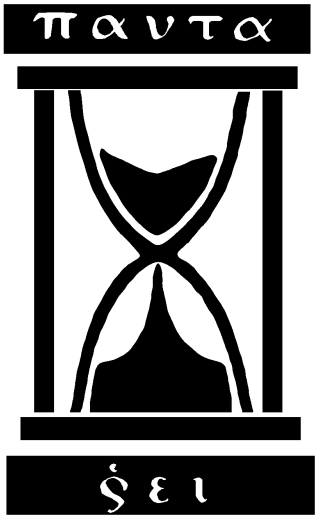

THE SOCIETY OF RHEOLOGY

70TH ANNUAL MEETING PROGRAM

Monterey Marriott
Monterey, California
October 4-8, 1998

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Local Arrangements:

Gerald G. Fuller
Stanford University

Abstract Book Editor and Webmaster:

Albert Co, ***University of Maine***

Meeting Schedule

Monday, October 5, 1998

8:30	G. Marrucci (PL1)			
9:20	Coffee			
9:45	NP1	GN1	EE1	SC1
10:10	NP2	GN2	EE2	SC2
10:35	NP3	GN3	EE3	SC3
11:00	NP4	GN4	EE4	SC4
11:25	NP5	GN5	EE5	SC5
11:50	Lunch			
1:30	NP6	GN6	EE6	SC6
1:55	NP7	GN7	EE7	SC7
2:20	NP8	GN8	EE8	SC8
2:45	NP9	GN9	EE9	SC9
3:10	Coffee			
3:35	NP10	GN10	EE10	IR1
4:00	NP11	GN11	EE11	IR2
4:25	NP12	GN12	EE12	IR3
4:50	NP13	GN13	EE13	IR4
5:15	End			
7:00	Society Reception			

Tuesday, October 6, 1998

8:30	J. M. Dealy (PL2)			
9:20	Coffee			
9:45	VP1	GN14	EE14	IR5
10:10	VP2	GN15	EE15	IR6
10:35	VP3	GN16	EE16	IR7
11:00	VP4	GN17	EE17	IR8
11:25	VP5	GN18	EE18	IR9
11:50	Lunch			
1:30	VP6	CF1	EE19	EX1
1:55	VP7	CF2	EE20	EX2
2:20	VP8	CF3	EE21	EX3
2:45	VP9	CF4	EE22	EX4
3:10	Coffee			
3:35	VP10	CF5	SL1	EX5
4:00	VP11	CF6	SL2	EX6
4:25	VP12	CF7	SL3	EX7
4:50	VP13	CF8	SL4	EX8
5:15	End			
5:30	Business Meeting			
7:00	Awards Reception			
8:00	Awards Banquet			

Wednesday, October 7, 1998

8:30	S. Granick (PL3)			
9:20	Coffee			
9:45	SE1	CF9	SL5	AN1
10:10	SE2	CF10	SL6	AN2
10:35	SE3	CF11	SL7	AN3
11:00	SE4	CF12	SL8	AN4
11:25	SE5	CF13	SL9	AN5
11:50	Lunch			
1:30	SE6	CF14	SL10	AN6
1:55	SE7	CF15	SL11	AN7
2:20	SE8	CF16	SL12	AN8
2:45	SE9	CF17	SL13	AN9
3:10	Coffee			
3:35	SE10	CF18	EM1	AN10
4:00	SE11	CF19	EM2	AN11
4:25	SE12	CF20	EM3	AN12
4:50	SE13	CF21	EM4	AN13
5:15	End			
5:30	Poster Session & Refreshments			

Thursday, October 8, 1998

8:05	SE14	FS1	EM5	AN14
8:30	SE15	FS2	EM6	AN15
8:55	SE16	FS3	EM7	AN16
9:20	SE17	FS4	EM8	AN17
9:45	Coffee			
10:10	SE18	FS5	JA1	AN18
10:35	SE19	FS6	JA2	AN19
11:00	SE20	FS7	JA3	AN20
11:25	SE21	FS8	JA4	AN21
11:50	SE22	FS9	JA5	AN22
12:15	End			

Session Codes

AN = Analytical and Numerical Solutions to Flow Problems
CF = Coupling Flow and Order in Fluids
EE = Extensional and Elongational Flow
EM = Rheology and Microstructure of Electro and Magneto-Rheological Fluids
EX = New Experimental Methods
FS = Polymer Friction, Slippage, and Dynamics Near Surfaces
GN = General Session
IR = Interfacial Rheology and Rheological Modifiers
JA = Jet Breakup, Atomization, and Spraying of Non-Newtonian Liquids
NP = Polymers with Novel Architectures
PL = Plenary Lectures
SC = Solutions and Coating Rheology
SE = Suspensions and Emulsions
SL = Rheology of Solids
VP = Viscoelastic Processing Flows: Theory and Experiment

Contents

This publication was generated with scripts developed by Albert Co. The contents of this publication were extracted from the database of The Society of Rheology abstract submission web site at http://www.umecheme.maine.edu/sorabst/.

Plenary Lectures

8:30 AM Steinbeck Forum

Monday, October 5

Recent Progress In The Theory Of Entangled Polymers In Fast Flows
Giuseppe Marrucci
Chemical Engineering, University of Naples

Tuesday, October 6
Bingham Lecture

Nonlinearities And Instabilities In The Flow Of Molten Polymers
John M. Dealy
Chemical Engineering, McGill University

Wednesday, October 7

Interfacial Rheology Of Simple Liquids And Polymers
Steve Granick
Materials Sci. and Engineering, University of Illinois

Social Program

Sunday, October 4

Welcoming Reception
6:00 PM - 8:00 PM Ferrante's, Monterey Marriott
Sponsored by T. A. Instruments

Monday, October 5

Society Reception
7:00 PM - 8:30 PM Memory Gardens, Fisherman's Wharf
Sponsored by Rheometrics, Inc.

Tuesday, October 6

Business Meeting
5:30 PM San Carlos I Ballroom

Awards Reception
7:00 PM North Foyer outside of San Carlos III
Sponsored by Haake, Inc.

Awards Banquet
8:00 PM San Carlos III Ballroom

Wednesday, October 7

Poster Session Refreshments
5:30 PM Main Foyer
Sponsored by PAAR Physica USA

Updates of Abstract Book

- **Paper AN15** (Thursday, 8:30, Los Angeles) is replaced with:

SIMULATION OF THE DOI-EDWARDS MODEL IN COMPLEX FLOW

Antoon P.G. van Heel, Martien A. Hulsen, and Ben H. A. A. van den Brule
Department of Mechanical Engineering and Marine Technology, Delft University of Technology, Delft 2628 AL, Netherlands

Two methods to simulate the Doi-Edwards model in a complex flow field are compared. The first method is based on a configuration field approach (JNNFM 70 (1997), 79-101), combined with a stochastic algorithm that mimics the reptation process.

In the second method a new (isotropic) ensemble of tube segments (unit vectors) is created every time step. The actual distribution of every ensemble is calculated using the deformation gradient that maps the distribution at the moment of creation to the distribution at the current time. The relative weight of a particular tube ensemble to the stress is decreased, as the ensemble becomes older in the course of the simulation. The weight function follows from the probability for a segment to survive for a certain period of time.

The flow problem we selected is the flow past a cylinder confined between two flat plates. It is shown that the second method is very efficient and has clear advantages over the first, more traditional, method.

- **Paper AN17** (Thursday, 9:20, Los Angeles) is replaced with "Modeling the Rheology of Suspensions of Spherical Particles with Adsorbed Polymers," by K. Zhang and C. W. Manke (previously AN18).

- **Paper AN18** (Thursday, 10:10, Los Angeles) is replaced with:

THE VISCOPLASTIC FLOW ANALYSIS OF COLD EXTRUDED CHOCOLATE

Nita C. Mulji and Malcolm R. Mackley
Department of Chemical Engineering, University of Cambridge, Cambridge CB2 3RA, United Kingdom

The cold extrusion processing of chocolate, where solid chocolate is isothermally extruded below its normal melting range, was first reported by Beckett et al. (1994). The material deformed plastically, as it was forced through an area reduction in a die, and a time dependent post extrusion plasticity was observed where the product hardened over time to its normal brittle state. A key benefit of this process is the ability to produce a diverse range of extrudate shapes. This paper presents some experimental, theoretical and numerical results obtained for the axisymmetric cold extrusion of chocolate. Chocolate can be usefully modelled as a rigid-plastic solid because of the existence of yield behaviour. The constitutive model used requires only one material parameter, the uni-axial yield stress for which a value has been obtained from the experimental data. In general, this is a function of temperature and chocolate composition. ABAQUS v5.5, a commercial finite element package, has been used to estimate the extrusion pressure for a variety of die geometries. The numerical simulation results have been shown to lie between lower and upper bound theorem predictions for dies with no die land. In particular, the effect of area reduction, die land length and flowrate on the extrusion pressure has been studied. Experiments showed that the wall boundary condition varied as the area reduction was increased. A closer examination of the results showed that the wall shear stress was constant for large area reductions and varied for the smaller area reductions.

- **Paper EE22:**

In the middle of the abstract, the sentence that reads:

> However, if the Reynolds number ... velocity field does not satisfy momentum conservation, and hence is not attainable.

should be replaced with:

> However, large values of the Reynolds number may cause undesirable effects, such as non-negligible viscous heating.

Monday, October 5

Morning

8:30 **PL1.** Recent progress in the theory of entangled polymers in fast flows. *G. Marrucci* Steinbeck Forum

9:20 COFFEE

	San Carlos I **Novel Polymers**	San Carlos III **General Session**	San Carlos II **Extensional & Elongational Flow**	Los Angeles **Solutions & Coating**
9:45	**NP1.** Characterization of dendrimers as model polymers with unique properties. *E. J. Amis, B. J. Bauer, T. J. Prosa and A. Topp*	**GN1.** Examination of a new molecular model for polydisperse systems of linear flexible polymer in steady and transient shear flows. *J. J. Driscoll, D. W. Mead, R. G. Larson, M. Doi and A. Berker*	**EE1.** Issues in extensional rheometry. *T. Sridhar*	**SC1.** Rheo-mechanical and rheo-optical characterization of viscoelastic polymer solutions. *W.-M. Kulicke and O. Arendt*
10:10	**NP2.** Structure and dynamics of multiarm star polymers. *D. Vlassopoulos, G. Fytas, T. Pakula, A. N. Semenov and J. Roovers*	**GN2.** Stress plateau behavior in fast flow of monodisperse polymeric fluids. *X. Yang and S.-Q. Wang*	**EE2.** The transient extensional viscosity of dilute and semi-dilute polymer solutions measured with a filament stretching rheometer. *K. W. Koelling and D. S. Shackleford*	**SC2.** Nonlinear viscoelasticity of polymer solutions: torque and normal force measurements in polystyrene/ortho-terphenyl mixtures. *V. Soulivong and G. B. McKenna*
10:35	**NP3.** The influence of dendrimers and hyperbranched polymers on the thermodynamics and rheology of linear polymers. *I. Bodnar, Y. H. Kim and N. J. Wagner*	**GN3.** Rheology of perfluoropolyether/poly 1h,1h-pentadecafluorooctyl methacrylate blends. *T. E. Karis*	**EE3.** Necking and breakup of viscoelastic fluid filaments in filament stretching devices during stretching and subsequent stress relaxation. *S. L. Anna, M. Yao and G. H. McKinley*	**SC3.** The dynamics of entangled polymer solutions subject to abrupt changes of shear rate. *J. P. Oberhauser and G. Leal*
11:00	**NP4.** The effect of long chain branching on the rheological behavior of metallocene polyethylenes. *P. M. Wood-Adams and J. M. Dealy*	**GN4.** Effects of wax crystallization on the flow of mineral oils. *R. M. Webber*	**EE4.** Flow light scattering studies of polymer coil conformation in solutions in extensional flow. *E. C. Lee and S. J. Muller*	**SC4.** Polyelectrolyte solution rheology. *R. H. Colby, W. E. Krause, D. C. Boris and J. S. Tan*
11:25	**NP5.** Predicting the linear viscoelastic behavior of star polymers utilizing an extension of the double reptation theory with no adjustable parameters. *T. J. Van Dyke, D. W. Mead and R. G. Larson*	**GN5.** Blends of linear and branched polyethylenes. *H. S. Lee and M. M. Denn*	**EE5.** Optical anisotropy of mobile viscoelastic liquids on transient planar extension flow. *T. Takahashi, H. Ohkouchi, M. Adachi and M. Shirakashi*	**SC5.** Scaling theory of hydrophobically modified polyelectrolytes.. *M. Rubinstein and A. V. Dobrynin*

11:50 LUNCH

Afternoon

San Carlos I **Novel Polymers**	San Carlos III **General Session**	San Carlos II **Extensional & Elongational Flow**	Los Angeles **Solutions & Coating**

1:30	**NP6.** Effects of microscopic and macroscopic architecture on the gelation and vitrification of thermoset resins. *J. Lange, P. J. Halley, C. T. Kelly and N. Altmann*	**GN6.** Is the bead-spring description applicable to unentangled polystyrene melts? *R. K. Verma and J. A. Kornfield*	**EE6.** The flow of a viscoelastic fluid in the stretching filament rheometer. *O. G. Harlen*	**SC6.** Solutions of associative polymers. *W. B. Russel, Q. T. Pham, J. T. Thibeault and W. Lau*
1:55	**NP7.** Bulk rheology of ethylenediamine (eda)-core polyamidoamine (pamam) dendrimers. *S. Uppuluri, F. A. Morrison and P. R. Dvornic*	**GN7.** Dynamics of disordered binary block copolymer blends. *R. Krishnamoorti and S. Rai*	**EE7.** A one-dimensional theory for extensional flow of a viscoelastic filament under exponential stretching. *D. O. Olagunju*	**SC7.** High-shear viscometry of polymer solutions. *P. Dontula, L. E. Scriven, C. W. Macosko, R. Garritano and P. Mode*
2:20	**NP8.** A new transient network model applied to guar gum. *R. H. W. Wientjes, M. H. G. Duits, R. J. J. Jongschaap and J. Mellema*	**GN8.** Component friction factors in styrene/isoprene mixtures. *J. M. Milhaupt and T. P. Lodge*	**EE8.** Accommodation of radially inhomogeneous regions in radially averaged melt spinning equations. *G. M. Henson and S. E. Bechtel*	**SC8.** Elastic instabilities in free surface displacement flows. *A. G. Lee and E. Shaqfeh*
2:45	**NP9.** Non-linear relaxation dynamics of multi-arm polymers. *M. T. Islam and L. A. Archer*	**GN9.** Segmental friction in polymer dynamics of entangled solutions and melts. *X. Yang and S.-Q. Wang*	**EE9.** Flow birefringence and computational studies of a polystyrene Boger fluid in axisymmetric stagnation flows. *W. R. Burghardt, J.-M. Li, B. Yang and B. Khomami*	**SC9.** Role of fluid elasticity and dynamic modulation on stability of single and multilayer coating flows. *C. T. Huang and B. Khomami*
3:10		COFFEE		
				Interfacial Rheology & Modifiers
3:35	**NP10.** A novel processing aid for polymer extrusion: rheology and processing of polyethylene and hyperbranched blends. *Y. Hong, J. J. Cooper-White, M. E. Mackay, C. J. Hawker, E. Malmstrom and N. Rehnberg*	**GN10.** Simple moving average formulae for the direct recovery of the relaxation spectrum. *A. R. Davies and R. S. Anderssen*	**EE10.** Brownian dynamics simulations of dilute polystyrene solutions. *L. Li, R. G. Larson, T. Sridhar and D. A. Nguyen*	**IR1.** Isotropic-nematic transition in a two-dimensional polymer solution. *K. S. Yim, G. G. Fuller, C. W. Frank and C. R. Robertson*
4:00	**NP11.** The rheology of gel phases of associating polymers in the phase separation regime. *G. Tae, J. A. Kornfield and J. A. Hubbell*	**GN11.** Nonlinear viscoelasticity of cheese. *S. Tariq, A. J. Giacomin and S. Gunasekaran*	**EE11.** Probing the coil-stretch-coil process in elongational flow of dilute polymer solutions. *J. M. Wiest*	**IR2.** Friction properties of confined films of chain alcohols. *F. G. Mugele, L. Broekman and M. Salmeron*
4:25	**NP12.** Dynamics and rheology of hairy rod polymers. *D. Vlassopoulos, G. Petekidis, G. Fytas, R. Rulkens and G. Wegner*	**GN12.** Trotters in exercise: the role of rheology, sedimentation and heolysis. *L. C. Cerny and E. R. Cerny*	**EE12.** Stress-birefringence hysteresis in extensional flows of dilute polymeric solutions: the effect of hydrodynamic interaction. *I. Ghosh, R. A. Brown, R. C. Armstrong and G. H. McKinley*	**IR3.** Surface rheological study of a polymerizable phospholipid monolayer. *C. F. Brooks, J. Thiele, G. G. Fuller, C. W. Frank, W. Knoll and D. F. O' Brien*
4:50	**NP13.** Preparations of interpenetrating polymer networks for improved cellulose ester plastics. *S.-W. Ho, W. E. S. Rochefort, J. B. Wilson and S. S. Kelley*	**GN13.** Viewing entanglements as a two phase system in polymer materials. *J. P. Ibar*	**EE13.** Quantification of entangled polymer behavior in shear and uniaxial elongational flows. *M. K. Lyon, C. Pattamaprom, R. G. Larson and D. W. Mead*	**IR4.** The novel technique of extrusion of pulp using carboxy-methyl-cellulose (CMC): effect of CMC characterisrics on pulp rheology. *M. Giri, W. E. S. Rochefort and J. Simonsen*
5:15		END		
7:00		SOCIETY RECEPTION Memory Gardens		

Tuesday, October 6

Morning

8:30 **PL2.** Nonlinearities in the flow of molten polymers. *J. M. Dealy* Steinbeck Forum

9:20 COFFEE

	San Carlos I Viscoelastic Processing Flows	San Carlos III General Session	San Carlos II Extensional & Elongational Flow	Los Angeles Interfacial Rheology & Modifiers
9:45	**VP1.** Studies of high Deborah number flows of a polyisobutylene in a long die with square cross section. *V. B. Birman, A. I. Leonov and J. Padovan*	**GN14.** Polypropylene crystallization as physical gelation process. *N. V. Pogodina, S. Siddique, J. van Egmond and H. H. Winter*	**EE14.** Extensional viscosities of polymer melts using RME and Münstedt rheometers: a comparative study. *J. Hepperle, H. Münstedt, T. Saito, J. S. Schulze, T. P. Lodge and C. W. Macosko*	**IR5.** Development of sharkskin melt fracture at the die exit in polybutadiene extrusion. *Y. W. Inn, R. J. Fisher and M. T. Shaw*
10:10	**VP2.** Experimental investigation of viscoelastic lid driven cavity flows. *A. M. Grillet, E. Shaqfeh and B. Khomami*	**GN15.** Effect of solvent quality on the gelation of kappa-carrageenan. *S. Ramakrishnan and R. K. Prud'homme*	**EE15.** Extensional viscosity measurements on slightly branched polyethylenes. *S. Bin Wadud and D. G. Baird*	**IR6.** Flow birefringence study of capillary extrusion of polybutadiene melts. *J. R. Barone and S.-Q. Wang*
10:35	**VP3.** Numerical simulation of flows of polymer solutions and melts through contractions. *E. Mitsoulis*	**GN16.** Polar association in polyethylacrylate observed at small shear and large elongation: effect of concentration of polar solvent. *N. Nakajima and J. Varkey*	**EE16.** Extensional rheology and failure of an ABS polymer melt. *C. E. Scott, S. E. Solovyov and T. L. Virkler*	**IR7.** Rheological modification of HDPE by addition of very low concentrations of tlcp. *C. K. Chan, C. Whitehouse and P. Gao*
11:00	**VP4.** Experimental observations and 3-D numerical simulations on the development of secondary flows induced by the second normal stress difference in straight channels. *B. Debbaut and J. Dooley*	**GN17.** Viscoelastic properties of polyurethane elastomers. *S. Velankar and S. Cooper*	**EE17.** Transient viscosity and molecular order in a thermotropic polyester LCP in uniaxial elongational flow. *W. A. Kernick and N. J. Wagner*	**IR8.** Extrusion of polyolephins and fluoropolymers with a new processing aid. *E. E. Rosenbaum, S. K. Randa, S. G. Hatzikiriakos and C. W. Stewart*
11:25	**VP5.** Three dimensional viscoelastic analysis of polymer melt flow: modeling and verification. *F. P. Baaijens, J. F. Schoonen, W. M. Verbeeten, A. Bogaerds, G. W. Peters and H. E. Meijer*	**GN18.** Viscoelastic behavior of cubic phases in block copolymer melts. *M. B. Kossuth, D. C. Morse and F. S. Bates*	**EE18.** Squeezing flow with partial slip at the walls. *P. V. Patil and L. A. Archer*	**IR9.** Block copolymers as rheology modifiers for polypropylene. *T. D. Jones, F. S. Bates and C. W. Macosko*

11:50 LUNCH

Afternoon

	San Carlos I Viscoelastic Processing Flows	San Carlos III Coupling Flow and Order	San Carlos II Extensional & Elongational Flow	Los Angeles New Experimental Methods
1:30	**VP6.** Numerical simulations of free surface viscoelastic flows using level-set method. *F. Alcocer, P. Singh and G. Leal*	**CF1.** Shear induced twist and splay in nematic liquid crystals. *D. M. Boudreau, C. P. Lillya, R. Stein and H. H. Winter*	**EE19.** Contraction/expansion flows of non-Newtonian monolayers. *D. J. Olson and G. G. Fuller*	**EX1.** A novel method to determine the complex viscoelastic coefficients of ultra-thin films. *C. C. White and W.-L. Wu*

1:55	**VP7.** The flow of polymer melts through a model porous medium. *W. H. Hartt and D. G. Baird*	**CF2.** Dynamics and alignment behavior of a thermotropic liquid crystalline polymer. *W. Zhou, J. A. Kornfield, V. M. Ugaz and W. R. Burghardt*	**EE20.** Elongational flow of solutions of hydrophobically modified polymers and surfactants. *S. Panmai, R. K. Prud'homme and D. G. Peiffer*	**EX2.** NMRI investigation of sedimentation of concentrated suspensions in non-Newtonian fluids. *S. Bobroff and R. J. Phillips*
2:20	**VP8.** Multilayer film casting of polyethylene melts: modeling and experiments. *B. Bian and A. Co*	**CF3.** Effect of spacer length on the response of microstructure to flow in thermotropic liquid crystalline polymers. *P. T. Mather, H. G. Jeon, C. D. Han and S. Chang*	**EE21.** Porous media flow of poly(ethylene oxide)/sodium dodecyl sulfate mixtures. *A. J. Muller, C. M. DaRocha, N. Ramirez and A. E. Saez*	**EX3.** Pointwise observations for rheological characterization. *R. L. Powell, A. Shekarriz, D. Arola, G. Barrall and M. McCarthy*
2:45	**VP9.** Impact of viscoelasticity on gage variations in film casting. *D. Rajagopalan*	**CF4.** Effect of shear induced phase transitions on the rheology of a thermotropic copolyester HBA/HQ/SA. *P. Gao and H. Lei*	**EE22.** Some design criteria for the convergent channel as an extensional rheometer. *P. R. Souza Mendes, R. L. Thompson and A. O. Nieckele*	**EX4.** Dynamic deformation visualization in swelling of polymer gels. *E. C. Achilleos, R. K. Prud'homme, K. N. Christodoulou, K. R. Gee and K. R. Kevrekidis*
3:10		COFFEE		
			Rheology of Solids	
3:35	**VP10.** Viscous heating and non-isothermal hydrodynamics in polymer solutions. *M. T. Arigo, L. E. Becker and G. H. McKinley*	**CF5.** Evidence of liquid crystalline rheology in polyethylene melts. *I. A. Hussein and M. C. Williams*	**SL1.** On the finite elasticity and hypo-elasticity. *A. I. Leonov*	**EX5.** A compressional rheometer for viscoelastic fluids. *P. R. Whittingstall and W. E. VanArsdale*
4:00	**VP11.** Flow analysis and experimental verification of gas-assisted injection moulding. *R.-F. Liang, D.-Y. Wang, X.-Z. Qu and R. Chen*	**CF6.** X-ray scattering measurements of molecular orientation in channel flows of a thermotropic liquid crystalline polymer. *D. K. Cinader, Jr. and W. R. Burghardt*	**SL2.** Investigations of nonlinear material behavior using simultaneous measurements of volume recovery and physical aging. *C. R. Schultheisz and G. B. McKenna*	**EX6.** Real time assessment of the rheological behavior of polymeric systems during extrusion. *J. M. Maia, J. A. Covas, J. M. Nóbrega, A. V. Machado and O. S. Carneiro*
4:25	**VP12.** Evaluation of constitutive equations for PVC formulations in extrusion dies. *T. Glomsaker, E. L. Hinrichsen, F. Irgens, A. G. Larsen and P. Thorsteinsen*	**CF7.** Extensional flow effects on morphology development in liquid crystalline polymers. *J. R. Dorgan and D. Yan*	**SL3.** Torsion of a polymer rod undergoing microstructural changes. *A. S. Wineman*	**EX7.** The effect of pressure on the viscoelastic properties of a LLDPE. *F. A. Koran and J. M. Dealy*
4:50	**VP13.** Performance of the generalized Newtonian fluid model in a complex flow of viscoplastic materials. *L. M. Freire, P. R. Souza Mendes, M. F. Naccache and L. F. Azevedo*	**CF8.** Manipulating LCP orientation in channel flows. *J. Feng, G. Sgalari and G. Leal*	**SL4.** A complete second order nonlinear viscoelastic model for amorphous polymers. *G. Medvedev, P. Shirkhande and J. M. Caruthers*	**EX8.** New approach in measuring low frequency viscoelastic properties. *E. M. C. Cua and M. T. Shaw*
5:15		END		
5:30		BUSINESS MEETING San Carlos I		
7:00		AWARDS RECEPTION Main Foyer		
8:00		AWARDS BANQUET San Carlos III		

Wednesday, October 7

Morning

8:30 **PL3.** Interfacial rheology of simple liquids and polymers. *S. Granick* Steinbeck Forum

9:20 COFFEE

	San Carlos I **Suspensions & Emulsions**	San Carlos III **Coupling Flow and Order**	San Carlos II **Rheology of Solids**	Los Angeles **Analytical & Numerical Solutions**
9:45	**SE1.** Deformation of a viscoelastic drop in the flow induced by a potential vortex. *K. Sarkar and W. R. Schowalter*	**CF9.** Direct numerical dynamic simulation of nematic defect structures in rectilinear shear flow. *T. Tsuji, A. D. Rey and S. Chono*	**SL5.** A modified TNM-KAHR model for hygrothermal effects on physical aging and structural recovery of an epoxy thermoset. *W. H. Han and G. B. McKenna*	**AN1.** Stability and nonlinear dynamics of viscoelastic shear flows subjected to secondary flow. *V. V. Ramanan, K. A. Kumar and M. D. Graham*
10:10	**SE2.** Rheological probing of the morphology development in immiscible blends during flow reversal. *P. Moldenaers, M. Minale and J. Mewis*	**CF10.** Elongation-induced biaxial patterns and instabilities. *G. Forest and Q. Wang*	**SL6.** Small-strain creep and aging of thermoplastic elastomers (TPE-E). *R. Wimberger-Friedl and H. de Bruin*	**AN2.** Stability of viscoelastic taylor-couette flow: influence of relaxation spectrum and energetics. *U. A. Al-Mubaiyedh, R. Sureshkumar and B. Khomami*
10:35	**SE3.** Deformation of a single fluid drop immersed in a second moving fluid: exact mathematical results for slow flows. *F. Greco*	**CF11.** Simulations of textured liquid crystalline polymers in shear flows. *M. N. Kawaguchi, R. Kupferman and M. M. Denn*	**SL7.** Modeling of materials showing viscoplastic behavior with nonlinear fractional-order differential equations. *A. D. Freed and K. Diethelm*	**AN3.** Stability analysis of the eccentric dean flow of an upper convected Maxwell fluid. *R. Sureshkumar and M. Avgousti*
11:00	**SE4.** Relationship between morphology and elastic recovery in immiscible blends. *I. Vinckier, P. Moldenaers and J. Mewis*	**CF12.** A continuum model for flow-induced crystallization of polymer melts. *A. J. McHugh, A. K. Doufas and I. S. Dairanieh*	**SL8.** Comparison of the volume and temperature dependence of various log a shift models with experimental data. *S. J. Lee, G. Medvedev and J. M. Caruthers*	**AN4.** Swirling flow of viscoelastic fluids: interaction between inertia and elasticity. *J. R. Stokes, N. J. Lawson, D. V. Boger and L. J. W. Graham*
11:25	**SE5.** Evolution of rheological properties during the formation of an emulsion of ink and fountain solution. *S. Mani, J. Jensen and W. Lim*	**CF13.** Motion of kink boundaries in layered liquids. *D. C. Morse*	**SL9.** Viscoelastic responses of nano-cluster reinforced polymers. *A. Lee*	**AN5.** Stability analysis of complex viscoelastic flows using time dependent simulations. *B. Yang and B. Khomami*

11:50 LUNCH

Afternoon

	San Carlos I **Suspensions & Emulsions**	San Carlos III **Coupling Flow and Order**	San Carlos II **Rheology of Solids**	Los Angeles **Analytical & Numerical Solutions**
1:30	**SE6.** Droplet coalescence in the shear flow of model emulsions. *A. Al-Mulla and R. K. Gupta*	**CF14.** Visualization of flow-induced order and dynamics by NMR. *P. T. Callaghan, M. M. Britton and M. L. Kilfoil*	**SL10.** Shape memory effect in inorganic-organic hybrid polymers. *H. G. Jeon, P. T. Mather and T. S. Haddad*	**AN6.** Structure of the spectrum in zero Reynolds number shear flow of the UCM and Oldroyd-B liquids. *H. J. Wilson, M. Renardy and Y. Renardy*
1:55	**SE7.** Shear modulus of a dry soap froth with random structure. *A. M. Kraynik and D. A. Reinelt*	**CF15.** Shear-induced phase changes in blends of poly(styrene-co-maleic anhydride) and poly(methyl methacrylate). *D. Chopra, D. Vlassopoulos and S. G. Hatzikiriakos*	**SL11.** Study on the polystyrene/high density polyethylene blends from an extrusion process. *B. Xu, J. Simonsen and W. E. S. Rochefort*	**AN7.** Instability due to second normal stress stratification in two-layer channel flow of the Giesekus fluid. *Y. Renardy and M. Renardy*

2:20	**SE8.** Viscoelasticity of dispersions containing associative polymers. *Q. T. Pham, W. B. Russel, J. T. Thibeault and W. Lau*	**CF16.** Shear rheology and microstructure of concentrated shear thickening colloidal dispersions. *J. Amante, R. J. Butera and N. J. Wagner*	**SL12.** Pressure wave stability in granular flow. *T. Astrita, R. Ocone and A. Pascarelli*	**AN8.** Studies on fiber spinning - solvability and spectral analysis in the nonisothermal viscous case. *T. Hagen and M. Renardy*
2:45	**SE9.** Rheology and microstructure of sheared arrays of colloidal particles. *J. J. Gray and R. T. Bonnecaze*	**CF17.** A simple model for shear-thickening. *J. L. Goveas and G. H. Fredrickson*	**SL13.** Viscoelastic properties of carbon fiber reinforced polysulfone composite as a new biomaterial. *K. Sun, C. C. Chen, R. J. Wu, C. Y. Yue and M. Wang*	**AN9.** The effect of non-zero second normal stress difference on flow in curved pipes. *A. M. Robertson, W. Jitchote and S. Chanchawichak*
3:10	COFFEE			
		Electro & Magneto-Rheological Fluids		
3:35	**SE10.** Stress relaxation in colloidal dispersions. *D. R. Foss and J. F. Brady*	**CF18.** Comparison of the effects of dimethyl and dichloro benzoate counterions on drag reducing and rheological behaviors and microstructures of a cationic surfactant. *Z. Lin, Y. Zheng, I. Talmon, H. T. Davis, L. E. Scriven and J. L. Zakin*	**EM1.** Magnetorheology with non-Newtonian suspending media. *P. J. Rankin and D. J. Klingenberg*	**AN10.** Investigation of the influence of rheological parameters on drag reduction, reynolds stress and vorticity budgets through direct numerical simulations.. *C. D. Dimitropoulos, R. Sureshkumar and A. N. Beris*
4:00	**SE11.** Measurement of shear-induced self-diffusion in concentrated suspensions by a novel method. *D. Van den Ende, V. Breedveld, R. J. J. Jongschaap and J. Mellema*	**CF19.** Coupling between structure and macroscopic behavior of flow-induced structures in dilute solutions of cationic surfactants exposed to different types of flow fields. *L. M. Walker, B. G. Thebaud and J.-F. Berret*	**EM2.** Magnetorheological and susceptibility probes of magnetic paints. *A. Potanin, R. J. Hirko, V. T. Peikov and A. M. Lane*	**AN11.** A model of turbulent drag reduction for dilute polymer solutions. *V. A. Gorodtsov and A. I. Leonov*
4:25	**SE12.** Friction force measurements on cellulose surfaces using colloidal probe microscopy. *S. Zauscher and D. J. Klingenberg*	**CF20.** Shear induced structures in micellar surfactant solutions (MISS) investigated by doppler ultrasound method. *P. Fischer, B. Ouriev and E. Windhab*	**EM3.** Modeling and computation of the effective magnetic properties of magnetorheological fluids. *T. M. Simon, H. T. Banks, K. Ito, M. R. Jolly, B. C. Munoz and F. Reitich*	**AN12.** Galerkin and least square finite element approach for viscoelastic fluid flows. *A. Rao and J. N. Reddy*
4:50	**SE13.** Colloid growth model for viscoelastic gels. *T. S. Chow*	**CF21.** Rheological properties of a dilute lyotropic sponge phase l3. *H. F. Mahjoub, M. Kleman, C. Bourgaux and J.-F. Tassin*	**EM4.** Dynamics simulations and effective properties for magneto-rheological fluids. *H. V. Ly, H. T. Banks, K. Ito, M. R. Jolly and F. Reitich*	**AN13.** A new method to compute a viscoelastic flow problem using integral constitutive equations. *E. A. J. F. Peters, M. A. Hulsen and B. A. A. van den Brule*
5:15	END			
5:30	POSTER SESSION & REFRESHMENTS Main Foyer			

Thursday, October 8

Morning

	San Carlos I **Suspensions & Emulsions**	San Carlos III **Friction, Slippage & Dynamics**	San Carlos II **Electro & Magneto-Rheological Fluids**	Los Angeles **Analytical & Numerical Solutions**
8:05	**SE14.** Rheological characterization of the liquid-solid transition in colloidal gels – lessons from polymers. *R. J. Butera*	**FS1.** Slip and reduced near-wall mobility of an entangled polymer melt in strong shear flow. *G. M. Wise, M. M. Denn, A. T. Bell, H. Iatrou and J. W. Mays*	**EM5.** Flow of muticomponent suspensions under high electric field. *S. W. Henley*	**AN14.** Computation of transient flows of dilute polymer solutions through an abrupt contraction using the adaptive Lagrangian particle method. *X. Gallez, P. Halin, R. Keunings and V. Legat*
8:30	**SE15.** Effect of oscillatory pre-shear on the elastic modulus of colloidal gels: microstructural interpretation using fractal concepts. *S. R. Raghavan, A. Potanin and S. A. Khan*	**FS2.** Molecular origin of wall slip and polymer surface instabilities. *V. R. Mhetar, T. Dao and L. A. Archer*	**EM6.** Studies of elastomers featuring high electrorheological response. *B. Liu and M. T. Shaw*	**AN15.** Simulation of the Doi-Edwards model in complex flow. *A. G. van Heel, M. A. Hulsen and B. A. A. van den Brule*
8:55	**SE16.** Particle motion in Newtonian and viscoelastic fluids: simulation and experiment. *H. Binous, R. J. Phillips, S. Porter and S. Bobroff*	**FS3.** Spurt flow of polybutadienes and polyisoprenes. *P. R. Manjeshwar, F. A. Morrison and J. W. Mays*	**EM7.** The rheology and morphology of electrorheological dispersions using an ER active polymer solution matrix. *G. P. Quist and F. E. Filisko*	**AN16.** Experimental observation and numerical simulation of planar flow within a confined slit for molten polyethylene. *R.-F. Liang, J. Wang and M. R. Mackley*
9:20	**SE17.** Relationship between the steady state and the complex oscillatory shear viscosity in planar randomly oriented concentrated fiber suspensions. *C. J. Servais and J.-A. E. Månson*	**FS4.** Interfacial stick-slip transition of monodisperse polybutadiene in capillary flow. *X. Yang and S.-Q. Wang*	**EM8.** Magnetorheological behavior of an inverse ferrofluid. *J. Mellema, B. J. De Gans, C. Blom and A. Philipse*	**AN17.** Modeling the rheology of suspensions of spherical particles with adsorbed polymers. *K. Zhang and C. W. Manke*
9:45		COFFEE		
			Jet Breakup, Atomization & Spraying	
10:10	**SE18.** Measurements of structure and rheology of fiber suspensions in Newtonian and viscoelastic fluids. *M. P. Petrich, C. Cohen and D. L. Koch*	**FS5.** Pressure and temperature effects in slit rheometry: implications for slip measurements. *G. Hay, K. M. Awati, Y. Park and M. E. Mackay*	**JA1.** Cavitation and the state of stress in a flowing liquid. *D. D. Joseph*	**AN18.** The viscoplastic flow analysis of cold extruded chocolate. *N. C. Mulji and M. R. Mackley*
10:35	**SE19.** Dynamics of nonuniform fibers. *P. Skjetne, C. F. Schmid and D. J. Klingenberg*	**FS6.** Rheology of poly (lactic acid) : high shear stress slip and general viscoelastic behaviour. *J. J. Cooper-White and M. E. Mackay*	**JA2.** Taylor-mode breakup of a polymeric liquid jet. *S. C. Tsai, P. Luu, S. Tsai and G. Roski*	**AN19.** Finite element simulations of viscoelastic porous media flows. *F. Alcocer and P. Singh*
11:00	**SE20.** NMR imaging of batch flotation and sedimentation. *S. A. Altobelli, J. D. Seymour and L. A. Mondy*	**FS7.** Wall-slip and polymer melt flow instability: analysis and modeling. *W. B. Black and M. D. Graham*	**JA3.** The effect of viscoelastic polymers on drop production in agricultural spays. *V. Romagnoli, P. Felton and R. K. Prud'homme*	**AN20.** Computer simulations of flowing behavior of particles in the asymmetrical hopper based on discrete element method. *C. S. Chou, L. J. Chiang, J. Smid, J. T. Kuo and S. S. Hsiau*

11:25	**SE21.** Hydrodynamic particle migration: a continuum limit. *W. L. Fisher, A. L. Graham, J. R. Abbott, L. A. Mondy and S. A. Altobelli*	**FS8.** A brownian dynamics study of solvent quality effects on polymer brushes. *T. Kwan, E. Shaqfeh, P. Schorr and M. Tirrell*	**JA4.** Atomization of self-associating polymer and polymer-surfactant solutions and emulsions. *S. M. Yurgelevic, Z. Ergungor, E. Gulari and C. W. Manke*	**AN21.** Mixing of two-phase fluids. *P. D. Anderson, G. W. Peters, F. P. Baaijens and H. E. Meijer*
11:50	**SE22.** Shear-induced particle migration in concentrated suspensions of noncolloidal particles. *M. Allende and D. M. Kalyon*	**FS9.** Friction and nanoindentation of crosslink polyamide surfaces. *S. K. Ahuja and K. R. Yoder*	**JA5.** Drop impact on solid surfaces. *R. C. Crooks and D. V. Boger*	**AN22.** An objective rotation tensor used in constitutive equations for viscoelastic fluids. *L. E. Wedgewood*
12:15		END		

Poster Session

Wednesday 5:30 PM Main Foyer

PO1. Squeezing flow testing. *D. A. Becker, C. W. Macosko and C. L. Rohn*

PO2. Sliding plate micro-rheometry of polymer melts. *G. J. Braithwaite and G. H. McKinley*

PO3. The controlled needle viscometer-a new rheological property measurement system. *N. A. Park*

PO4. Thermal expansion of the force rebalance transducer in a Rheometric Scientific ARES rotary rheometer. *G. B. McKenna and C. R. Schultheisz*

PO5. A nonlinear fluid standard reference material: progress report. *C. R. Schultheisz and G. B. McKenna*

PO6. Evaluation of the viscosity pressure coefficient using two methods. *F. A. Koran, M.-C. Heuzey and J. M. Dealy*

PO7. Rheo-optical FTIR spectroscopy of polymer dynamics. *R. M. Kannan*

PO8. Modelling LDPE melt rheology with the pom-pom model. *N. J. Inkson, T. C. B. McLeish and O. G. Harlen*

PO9. Stochastic simulations of a full-chain model for the linear viscoelasticity of entangled polymers. *H.-Y. Kuo and C.-C. Hua*

PO10. Critical tests of polymer dynamics and the viscosity problem. *R. P. Wool and K. A. Welp*

PO11. Verification of the CCR model: linear and star polymers. *W. T. Rogers, A. Somwangthanaroj, A. Berker, M. Doi, J. J. Driscoll, M. K. Lyon and D. W. Mead*

PO12. Rheological behavior of chemically modified polyethylenes. *R. Perera, C. M. Rosales and H. A. Rojas*

PO13. Pressure characteristic for non-isothermal flow of the thermoplastic polymers melts in circular confuser. *L. M. Uliev*

PO14. A new model for the amorphous phase of polymers. *J. P. Ibar*

PO15. Birefringence and viscoelasticity of low molecular weight polystyrenes around the glass transition zone. *T. Inoue and K. Osaki*

PO16. Characterization of slip mechanisms between crosslinked polydimethylsiloxane and silica surfaces. *L. H. Genieser and F. P. Baaijens*

PO17. Elimination of sharkskin and stress reduction using a brass die. *V. G. Ghanta, B. L. Riise and M. M. Denn*

PO18. The spurt phenomenon for single integral constitutive equations. *R. W. Kolkka and D. S. Malkus*

PO19. Surface instabilities in compressed or bent rubber blocks. *A. N. Gent*

PO20. Surface roughness of dough during extrusion. *S. Chakrabarti, D. Kittleson and A. Oppenheimer*

PO21. Some rheological properties of human vocal fold tissues. *R. W. Chan and I. R. Titze*

PO22. Rheology in daily life – the new ORBITZ drink. *W. E. S. Rochefort and J. Hower*

PO23. Dynamics of structure formation in highly-filled organo-ceramic composites. *J. A. Walberer and A. J. McHugh*

PO24. Dynamic rheological properties of HDPE/ethylene-alpha-olefin copolymer blends. *R. A. Morales, J. J. Sánchez, M. E. Matos and A. J. Müller*

PO25. Rheological and morphological aspects of phase transition in a polymer blend. *D. B. Hess and S. J. Muller*

PO26. Nonequilibrium thermodynamics modeling of constitutive equations for polymer blends and colloids by GENERIC. *N. J. Wagner*

PO27. Short-time dynamics of concentrated charge stabilized polymer dispersions. *F. M. Horn, J. Bergenholtz, W. Richtering, N. Willenbacher and N. J. Wagner*

PO28. Measurements and modeling on a colloidal dispersion of polymerically stabilized spheres. *P. A. Nommensen, M. H. G. Duits, D. v. d. Ende and J. Mellema*

PO29. Microstructure and rheological properties of aqueous CTAB solutions in the presence of sodium salicylate. *K. Won-Jong, Y. Seung-Man and P. O-Ok*

PO30. Effect of tube diameter on viscosity measurements for surfactant solutions. *G. Aguilar, K. Gasljevic and E. F. Matthys*

PO31. Dynamics of micellar structure formation and break-up in turbulent flow of surfactant solutions. *K. Gasljevic, K. Hoyer and E. F. Matthys*

PO32. Turbulent pipe flow drag reduction with narrow distribution polystyrene materials- a test of drag reduction theories. *D.-W. D. Yu and W. E. S. Rochefort*

PO33. Rheo-optical study of associative polymer solutions. *J. F. Le Meins and J.-F. Tassin*

PO34. Rheo-optical behavior of poly-l-lysine. *A. T. Lee and A. J. McHugh*

PO35. The rheology of dendrimeric and hyper branched polymers. *I. Sendijarevic and A. J. McHugh*

PO36. Viscoelasticity of tightly-entangled solutions of semi-flexible polymers. *D. C. Morse*

PO37. Rheological behavior of electrorheological fluids: effect of the dielectric properties of liquid phase. *L. Rejón-García, I. Castañeda-Aranda, O. Manero and V. M. Castaño*

PO38. Macroscopic approaches to ER and MR via electro- and magnetostriction. *Y. M. Shkel, V. A. Naletova and D. J. Klingenberg*

PO39. Polarimetry and SALS experiments to characterize ferrofluids subject to an external magnetic field. *S. Melle, G. G. Fuller and M. A. Rubio*

PO40. Rheological properties of physical networks formed in lipopolymer monolayers. *C. F. Brooks, C. A. Naumann, G. G. Fuller, C. W. Frank and W. Knoll*

PO41. Viscoelastic behavior of polymers tethered to the air/water interface. *C. Luap and W. A. Goedel*

PO42. DNA micro-hydrodynamics: a tool in optical gene mapping. *M. Chopra and R. G. Larson*

PO43. Fluid mechanical studies of the effects of polymer concentration in the Boger fluid regime. *G. Leal, J. P. Oberhauser, G. M. Harrison, J. Remmelgas and D. H. Kim*

PO44. A Brownian dynamics study of solvent quality effects on polymer in exponential shear flow. *T. Kwan, E. Shaqfeh, J. S. Hur and A. P. Gast*

PO45. Onset and evolution of elastic instabilities in flow through periodic arrays of cylinders. *J. L. Piper, R. Sureshkumar and B. Khomami*

PO46. Computational simulations for protein structure predictions. *A. Rojnuckarin, S. Kim and S. Subramaniam*