tions with the Barkley model suggesting that the observed filament behavior was caused by the 3D variant of the meandering instability.

SYSS 3.14 Thu 16:00 P1

Hydrodynamic instabilities in the iodate-arsenous acid reaction — •Lenka Šebestíková, Marcus J. B. Hauser, and Stefan C. Müller — University Magdeburg, Institute of Experimental Physics, Universitaetsplatz 2, 39106 Magdeburg

The splitting of fingers of propagating fronts in the arsenous acid-iodate reaction placed in a vertical Hele-Shaw cell is found to be driven by liquid flow induced by density differences in the gravitational field. The ascending thin reaction front separates the heavier reaction solution from the lighter reacted mixture. During the early stages, the finger structure of the reaction front is formed. As the fingers grow vertically and horizontally, some of them dominate and some annihilate. Correspondingly, the profile of the induced flow that is associated with the fingers is changed. We discuss how the finger splitting is related to the curvature of the reaction front and the adjacent flow field.

SYSS 3.15 Thu 16:00 P1

Spiral vortices traveling between two rotating defects in the Taylor-Couette system — •Christian Hoffmann — Institut für Theoretische Physik, Universität des Saarlandes, 66123 Saarbrücken

We present numerical calculations of vortex flows in Taylor-Couette systems with counter-rotating cylinders. The full, time dependent Navier-Stokes equations are solved with a combination of a finite difference and a Galerkin method. Systems of several cylinder lengths are simulated. They are closed by nonrotating lids. These rigid ends produce localized Ekman vortices in their vicinity and that prevent axial phase propagation of spiral vortices. Existence and spatio temporal properties of rotating defects, of modulated Ekman vortices, and of the spiral vortex structures in the bulk are presented in quantitative detail.

SYSS 3.16 Thu 16:00 P1

Traveling wave fronts and localized traveling wave convection in binary fluid mixtures — •Dominik Jung and Manfred Luecke — Institut für Theoretische Physik, Universität des Saarlandes, Postfach 151150, D-66041 Saarbrücken, Germany

Nonlinear fronts between spatially extended traveling wave convection (TW) and quiescent fluid and spatially localized traveling waves (LTWs) are investigated in quantitative detail in the bistable regime of binary fluid mixtures heated from below. A finite-difference method is used to solve the full hydrodynamic field equations in a vertical cross section of the layer perpendicular to the convection roll axes. Results are presented for ethanol-water parameters with several strongly negative separation ratios where TW solutions bifurcate subcritically. Fronts and LTWs are compared with each other and similarities and differences are elucidated. Phase propagation out of the quiescent fluid into the convective structure entails a unique selection of the latter while fronts and interfaces where the phase moves into the quiescent state behave differently. Interpretations of various experimental observations are suggested.

[1] D. Jung and M. Lücke, Phys. Rev. E **71**, 026307 (2005)

SYSS 3.17 Thu 16:00 P1

The Effect of an Axial Flow on Spiral Vortices and Taylor Vortices — •Christian Hoffmann — Institut für Theoretische Physik, Universität des Saarlandes, 66123 Saarbrücken

We present numerical simulations of vortices that appear via primary bifurcations out of the unstructured circular Couette flow in the Taylor-Couette system with counter- and co-rotating cylinders. The full Navier-Stokes equations are solved with a combination of a finite difference and a Galerkin method for fixed axial periodicity lengths of the vortex patterns as well as for finite systems with rigid nonrotating lids. Differences in structure, dynamics, symmetry properties, bifurcation and stability behavior between spiral vortices and Taylor vortices are discussed in quantitative detail and compared to experimental spiral data. Furthermore, we analyze how the above properties are changed by an externally imposed axial through-flow. In particular we investigate when left handed or right handed spirals or toroidally closed Taylor vortices are preferred.

SYSS 3.18 Thu 16:00 P1

Investigation of Structure and Stability of Electrochemically Produced Mesoscale Silver Wires and Dendrites — •Thomas Koch[1,2], Sheng Zhong[1,2], Harald Roesner[2], Horst Hahn[2], Eberhard Nold[3], Dong Wang[4], Mu Wang[5], Stefan Walheim[2], and Thomas Schimmel[1,2] — [1]Institute of Applied Physics, University of Karlsruhe, D-76128 Karlsruhe, Germany — [2]Institute of Nanotechnology (INT), Forschungszentrum Karlsruhe, D-76021 Karlsruhe, Germany — [3]Institute for Materials Research I (IMF I), Forschungszentrum Karlsruhe, D-76021 Karlsruhe, Germany — [4]Institute for Materials Research II (IMF II), Forschungszentrum Karlsruhe, D-76021 Karlsruhe, Germany — [5]National Laboratory of Solid-State Microstructures, Nanjing University, Nanjing 21009, China

Silver mesostructures in particular have been in the focus of research due to the special properties of silver such as the highest electrical or thermal conductivity. Here we present the investigation of the structure, composition and time stability of thin mesoscale silver wires and dendrites, which were produced by a novel and simple electrochemical deposition approach. For the analysis Scanning Electron Microscopy, Transmission Electron Microscopy and Scanning Auger Micro Spectrometry were used. The wire diameters range down to 100 nm and the wire lengths up to 150 μm and more. The obtained structures are single-crystalline and stable under ambient conditions for several months. Thus these structures are of interest for application e.g. in micro electronics.

SYSS 3.19 Thu 16:00 P1

Delay of Disorder by Diluted Polymers — •Christian Wagner — Institut fuer Experimentalphysik, Universitaet des Saarlandes, D-66123 Saarbrücken

We study the effect of diluted flexible polymers on a disordered capillary wave state. The waves are generated at an interface of a dyed water sugar solution and a low viscous silicon oil. This allows for a quantitative measurement of the spatio-temporal Fourier spectrum. The primary pattern after the first bifurcation from the flat interface are squares. With increasing driving strength one observes a melting of the square pattern. It is replaced by a weak turbulent cascade. The addition of a small amount of polymers to the water layer does not affect the critical acceleration but shifts the disorder transition to higher driving strengths and the short wave length - high frequency fluctuations are suppressed.

SYSS 3.20 Thu 16:00 P1

Coherent structures and energy fluxes in amplitude space in turbulent wave dynamics — •Benno Rumpf[1], Guenter Radons[1], Alan Newell[2], and Laura Biven[3] — [1]Physics Institute, TU Chemnitz, 09107 Chemnitz, Germany — [2]Mathematics Department, University of Arizona, Tucson, Arizona, USA — [3]Max-Planck-Institut fuer Physik komplexer Systeme, 01187 Dresden, Germany

High-amplitude structures emerge intermittently from a background of low-amplitude disordered waves in nonequilibrium wave dynamics where a driving force is applied on long spatial scales, and damping at a short viscous scale. It is shown that the coherent structures cause an energy flux in amplitude space, while weakly interacting low-amplitude waves lead to an energy flux in wavenumber space.

[1] B.Rumpf, L.Biven, Weak turbulence in the Majda-McLaughlin-Tabak equation: Fluxes in wavenumber and in amplitude space, Physica D 204, 188-203, (2005)

[2] B.Rumpf, A.C.Newell, Intermittency as a consequence of turbulent transport in nonlinear systems, Phys.Rev.E 69, 026306, (2004)

SYSS 3.21 Thu 16:00 P1

Spatially localized stationary convection in binary mixtures with weakly negative Soret effect — •Dominik Jung and Manfred Luecke — Institut für Theoretische Physik, Universität des Saarlandes, Postfach 151150, D-66041 Saarbrücken, Germany

The convective behaviour of a binary fluid layer (e. g. ethanol-water) heated from below has been simulated numerically for realistic boundary conditions. Because of the negative Soret effect ethanol migrates to the colder regions in a temperature gradient. The corresponding influence on buoyancy distribution makes a wide range of convection structures possible.

We found spatially localized patches of stationary overturning convection rolls (LSOC) which are stably surrounded by quiescent fluid. LSOCs can coexist at the same heating with spatially periodic stationary overturning convection (SOC), extended waves of travelling rolls (TW) and