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The Cyber Infrastructure Initiative for Rheology

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Abstract

A new cyberinfrastructure for rheology (CIR) has the potential of integrating the diverse rheological knowledge of experts around the world (see *Rheologica Acta*, 2006; DOI 10.1007/s00397-005-0041). In a multi-disciplinary effort, experts in specialized topics of rheology began to write CIR-modules that seamlessly merge into a general code so that it can be used by a wide range of engineers and scientists. At the center of CIR is a platform operating system that connects a wide range of dedicated software modules. These CIR-modules perform calculations and return the corresponding results to a central graphics screen. The computer platform allows the detailed analysis of experimental data, the communication of data, and the prediction of rheological material functions from a wide range of theories in rheology. Rheologists can access each other's experimental results, make predictions with each other's theories and simulate with each other's computer codes. Through such collaboration, seemingly disparate theories and experimental observations can be linked and taken to their limits, thereby leading to unexpected insights and new questions. Beyond the pool of experts, CIR will draw industrial users into the rheology discussion. Easy to use CIR-tools will allow industrial rheologists to adjust rapidly to the changing needs and the pressure to obtain short-term solutions in a competitive environment. CIR has the potential of generating ideas for novel materials and novel manufacturing methods. At the same time, it will supply the tools to examine ideas quantitatively and to push these ideas even further.