

PROJECT LEADERS

F Vermolen, C Vuik

RESEARCH THEME

Complex dynamics of fluids

PARTICIPANTS

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COOPERATIONS

TUD/ Applied Earth Sciences, TUE

FUNDED

TUD

1st 100% 2nd - 3rd -

START OF THE PROJECT

2000

INFORMATION

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PROJECT AIM

The aim is to develop and analyze mathematical models for multi-phase fluid flow, flow of polymeric solutions and foam penetration in porous media. The most important application is oil recovery from underground reservoirs. For some cases we are interested in the qualitative characteristics, like the existence of travelling waves and free boundaries, of the solutions of the equations involved in the models.

PROGRESS

A paper about phase segregation (spinodal decomposition) is being written. A numerical method for the multi-component case in a more-dimensional setting has been accomplished. Further, a Finite Element scheme has been developed for the solution of a stress-enhanced diffusion equation in collaboration with prof Bruining. This equation involved very rapidly changing nonlinear diffusive terms and cross derivatives with respect to time and spatial variables. Papers are being written about these two topics. Further, the lastmentioned model will be extended in the framework of a jointly supervised MSc-project (with prof. Bruining).

DISSERTATIONS

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SCIENTIFIC PUBLICATIONS

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