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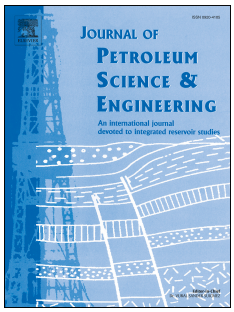

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Investigation of Sand Transport in an Undulated Pipe using Computational Fluid Dynamics

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Abstract

A CFD model has been implemented to investigate the effects the pipe undulation on sand transport. Of particular interest of the present study is the sand deposition in small angled V-inclined bend relevant to oil and gas subsea flowlines where sand deposition could be a major problem. The model used is the two-fluid Eulerian-Eulerian model with the granular temperature to tackle the solid phase properties. A number of sub-models for tackling solid-fluid and fluid-fluid interaction has been incorporated in the modelling frame work to capture the transition of flow regimes. The simulation results show that the seemingly small angled V-inclined has significant impact on sand disposition compared to the horizontal section. Sand is deposited at the downstream section of the V-inclined pipe at much higher velocities compared to the minimum transport velocity of the horizontal pipe.

Keywords: sand deposition; Eulerian model; V-inclined.