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Numerical Study of Pressure Losses of Turbulence Drilling Fluid Flow in the Oil Wellbore

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Abstract : In this paper the pressure loss of drilling fluid flow in the annulus is investigated. On this purpose the domains between two concentric and two eccentric cylinders are considered as computational domains. In this research foam is used as drilling fluid. Firstly simulation results for laminar flow and non Newtonian fluid and different density like 100, 200, 300 kg/m3 and different inner cylinder rotational velocity like 100, 200, 300 RPM is presented. These results are compared and matched with references results. The power law and Herschel Bulkly methods are used for non Newtonian fluid modeling. After that computations are repeated with turbulence flow considering. K-□ Model is used for turbulence modeling. Results show that in laminar flow Herschel bulkly model has best result in comparison with power law model. And pressure loss in turbulence flow is higher than laminar flow.

Keywords : simulation, concentric cylinders, drilling, non Newtonian
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