1126-65-88 **Jiangyong Hou**, **Meilan Qiu**, **Chaohua Guo**, **Xiaoming He*** (hex@mst.edu), **Mingzhen Wei** and **Baojun Bai**. *Coupling dual-porosity flow and free flow.*

We propose and numerically solve a new model considering confined flow in dual-porosity media coupled with free flow in embedded macro-fractures and conduits. Such situation arises, for example, for fluid flows in hydraulic fractured tight/shale oil/gas reservoirs. The flow in dual-porosity media, which consists of both matrix and micro-fractures, is described by a dual-porosity model. And the flow in the macro-fractures and conduits is governed by the Stokes equation. Then the two models are coupled through four physically valid interface conditions on the interface between dual-porosity media and macro-fractures/conduits, which play a key role in a physically faithful simulation with high accuracy. All the four interface conditions are constructed based on fundamental properties of the traditional dual-porosity model and the well-known Stokes-Darcy model. The weak formulation is derived for the proposed model and the well-posedness of the model is analyzed. A finite element semi-discretization in space is presented based on the weak formulation. The full discretization with backward Euler scheme is utilized and analyzed. Four numerical experiments are presented to validate the proposed model and demonstrate the features of both the model and numerical method. (Received January 05, 2017)