1117-35-24 **Viktoria Savatorova*** (vsavatorova@gmail.com) and **Alexey Talonov** (alextalonov@gmail.com).

Homogenization of PDEs arising in Dual-Porosity Models for Fluid Flow in Organic-Rich Shales.

We consider a single phase fluid flow through a porous medium, consisting of organic inclusions imbedded into inorganic matrix. There exist a contrast of properties and spatial scales between the matrix and inclusions. The pore size can vary from micro- to nanometers, permeability and diffusivity can differ by several orders of magnitude. The double porosity model is derived as a system of coupled parabolic equations, the interchange of fluid between the matrix and the inclusions is taken into account. We apply multi-scale analysis to mass balance equations considering such processes as desorption of gas from organic nanopores, diffusion, and filtration. We assume that the free gas is in the inorganic pores and transported by the mechanisms of filtration and molecular diffusion, whereas the sorbed phase is in the inclusions and transported by the surface diffusion mechanism. We focus on the upscaling from pore-scale to the core-scale and then from core-scale to reservoir scale. We derive homogenized macroscopic problem for fluid concentration in effective medium for the given initial and boundary conditions. The properties of effective medium depend on size and spatial distribution of the inclusions as well as on properties of both inclusions and matrix. (Received December 07, 2015)