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Malgorzata Peszynska* (mpesz@math.oregonstate.edu), Oregon State University, Department of Mathematics, Corvallis, OR 97331. *Multiscale computational model of biofilm in porous media: from images to finite element analysis to the outlook beyond DNS.*

We discuss a project motivated by applications in reservoir engineering with data from micro-ct tomography of biofilm formation at the pore-scale. We motivate the model posed as a system of parabolic variational inequalities coupled by Monod growth terms. Next we present rigorous finite element analysis of the approximate solutions, and illustrate the model with simulations. We also discuss upscaling as well as outlook beyond Direct Numerical Simulations. This research is joint with many collaborators and students to be named in the talk. (Received March 03, 2020)