

**abstract-muntean.txt**

**Nonlinear micro-macro transmission conditions for a two-scale RD system for gas-liquid reactions : well-posedness and fast-reaction asymptotics**

**I consider a coupled two-scale (micro-macro) nonlinear reaction-diffusion system**

**modelling gas-liquid reactions. The novel feature of the model is the presence of a nonlinear transmission condition coupling the microscopic and macroscopic concentrations, given by a nonlinear Henry-type transfer function. The solution is approximated by using a Galerkin method adapted to the multiscale form of the system. This approach leads to the existence and uniqueness of the solution, and can be used for numerical computations of a larger class of nonlinear multiscale problems. Finally, I show that in the fast-reaction limit the two-scale system converges to a two-scale free-boundary problem (with the free boundary traveling the microstructure). The results reported here are partly obtained together with Maria-Neuss Radu (Heidelberg) and Omar Lakkis (Sussex).**