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## Global existence for reaction-diffusion systems with nonlinear diffusion and control of mass

In this talk, we present some new results on the global existence in time of weak solutions for some reaction-diffusion systems with natural structure conditions on the nonlinear reactive terms which provide positivity of the solutions and uniform control of the total mass. The diffusion operators are nonlinear, in particular operators of the porous media type  $u_i \mapsto -d_i \Delta u_i^{m_i}$ . Global existence is proved under the assumption that the reactive terms are bounded in  $L^1$ . This extends previous similar results obtained in the semilinear case when the diffusion operators are linear of type  $u_i \mapsto -d_i \Delta u_i$ .

### References

- [1] K. Fellner, E.-H. Laamri, *Exponential decay towards equilibrium and global classical solutions for nonlinear reaction-diffusion systems*, to appear in J. Evol. Equ.
- [2] E.-H. Laamri, *Global existence of classical solutions for a class of reaction-diffusion systems*, Acta Appl. Math. 115 (2011), 153–165.
- [3] E.-H. Laamri, M. Pierre, *Global existence for reaction-diffusion systems with nonlinear diffusion and control of mass*, to appear in Ann. Inst. H. Poincaré Anal. Non Linéaire.
- [4] M. Pierre, *Weak solutions and supersolutions in  $L^1$  for reaction-diffusion systems*, J. Evol. Equ. 3 (2003), 153–168.
- [5] M. Pierre, *Global Existence in Reaction-Diffusion systems with Dissipation of Mass: a Survey*, Milan J. Math. 78 (2010), 417–455.