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Travelling Waves in a highly degenerate PDE-ODE coupled model of cellulosic biofilm formation

In Eberl et al, *Biochem.Eng.J.*, 122, 2017, we presented a PDE-ODE coupled model describing inverse colony formation of cellulolytic biofilms which play a role in sustainable energy production, more specifically bioethanol that is produced from non edible, non-feedstock biomass such as wood and grass. The PDE component is a highly degenerated quasilinear diffusion reaction equation that encompasses both a porous-medium degeneracy where the dependent variable vanishes and a super-diffusion singularity as it approaches its maximum physical limit. In that earlier paper we also presented numerical simulations that suggest the possibility of travelling waves (for which there is also some, albeit scant, experimental evidence. In this talk I will present an existence and a non-existence theorem for such TW solutions, in dependence on model parameters.