Donatella Donatelli and Konstantina Trivisa* (trivisa@math.umd.edu), Department of Mathematics, University of Maryland, College Park, MD 20742. On a nonlinear model for tumor growth: Global in time weak solutions.

We investigate the dynamics of a class of tumor growth models known as mixed models. The key characteristic of these type of tumor growth models is that the different populations of cells are continuously present everywhere in the tumor at all times. In the present article we focus on the evolution of tumor growth in the presence of proliferating, quiescent and dead cells as well as a nutrient. The system is given by a multi-phase flow model and the tumor is described as a growing continuum $\Omega$ with boundary $\partial\Omega$ both of which evolve in time. Global-in-time weak solutions are obtained using an approach based on penalization of the boundary behavior, viscosity and the pressure in the weak formulation. (Received September 13, 2013)