1154-65-821 **Xianyi Zeng*** (xzeng@utep.edu), Bell Hall 202, 500 W University Ave, El Paso, TX 79968, and **Mashriq Saleh** and **Jianjun Paul Tian**. *A finite volume method for infiltration dynamics in tumor growth models.*

We address numerical challenges in free boundary problems described by spherically symmetric conservation laws that arise in the modeling of tumor growth due to immune cell infiltrations. In particular, we normalize the radial coordinate to transform the free boundary problem to a fixed boundary one, and utilize finite volume methods to discretize the resulting equations. The conventional finite volume methods fail to preserve constant solutions and the incompressibility condition, and they typically lead to inaccurate solutions, if not wrong at all. These issues are addressed in a new finite volume framework with segregated flux computations that satisfy sufficient conditions for ensuring the so-called totality conservation law and the geometric conservation law. First- and second-order methods are constructed within this framework, and their numerical performances are assessed by various tests, including the prediction of a "rim" near the tumor boundary in a PDGF-driven glioma simulation. (Received September 11, 2019)