LECTURES on Numerical Mathematics and Applications

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Francisco J. Gaspar
University of Zaragoza

Introduction to the poroelasticity problem

Nowadays, poroelastic models are used to study problems in many diverse areas as geomechanics, hydrogeology, biomechanics, and food processing for example. Therefore, the study of this type of problems is of great interest to scientists and engineers. Porous food products make up a significant part of all of the food products being manufactured today. Due to the rising competition in food market share, and higher quality requirements, various methods of product quality control are being actively developed, some of them based on the poroelasticity theory. In this lecture, we will introduce the basics of the poroelasticity problem and the numerical difficulties that appear in its numerical resolution. We will treat mathematical and practical aspects of models for poroelasticity, with an emphasis on a stable numerical discretization of the system of equations.

Lehrstuhl für Mathematik IX (Wissenschaftliches Rechnen)
Emil-Fischer-Str. 30 • 97074 Würzburg • Germany • Tel.: 0049-931 31-83843 • Fax: 0049-931 31-81491
Email: l-math9@mathematik.uni-wuerzburg.de • www9.mathematik.uni-wuerzburg.de