

MATHEMATICAL MODELLING AND DESIGN EXPERIMENTS IN BIOVENTING SUBSOIL DECONTAMINATION

Filippo Notarnicola

Istituto per le Applicazioni del Calcolo, Consiglio Nazionale delle Ricerche (IAC – CNR)
Via Amendola 122-d, 70126 Bari, Italy
e-mail: f.notarnicola@ba.iac.cnr.it

Summary. Bioventing is a subsoil bio-remediation technique which improves the activity of bacteria to transform contaminants into less hazardous compounds by inflating air through wells. The mathematical model describes the bacteria population dynamics and the dynamics of a multiphase, multicomponent fluid in porous media and in this paper a simple version of it will be described. A critical point of the design problem is to choose well positions and air flow rates to optimise the biodegradation process. The numerical simulation and some initial optimisation design results for the simple model proposed will be reported. The decontamination time required for different flow rates and for different well spatial configurations will be compared.