MODELING THE FLASH METHOD BY USING A CONDUCTO-RADIATIVE MONTE CARLO ALGORITHM : APPLICATION TO POROUS MEDIA

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ABSTRACT. In the following paper, both conduction and radiation heat transfer were explored with a Monte-Carlo method applied to a complex geometry. The algorithm accounted for the coupling of conduction in the solid phase and radiation through the void phase and is used for direct simulation of a flash method. This allowed us to evaluate the effective total conductivity of the equivalent homogenized medium in function of a wide range of thermal, optical and geometric properties. The influence of the hemispherical emissivity of the struts material, the porosity and the diameter of the cells are investigated. Moreover, this procedure appears to be a useful tool to confirm whether or not the assumption of the diffuse radiation (Rosseland) is valid.