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Graciela Bertolino, Mariano Cantero, Mario Storti y Federico Teruel (Eds.)
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COMPARISSON BETWEEN POROUS MEDIA MODEL AND MICROSCOPIC FLOW SIMULATIONS FOR HEAT TRANSFER

Federico E. Teruel

División de Mecánica Computacional, Centro Atómico Bariloche, Av. Ezequiel Bustillo 9500, 8400 San Carlos de Bariloche, Río Negro, Argentina, teruel@cab.cnea.gov.ar

CONICET, Centro Atómico Bariloche, Av. Ezequiel Bustillo 9500, 8400 San Carlos de Bariloche, Río Negro, Argentina

Abstract. Numerical experiments in multiple Representative Elementary Volumes (REVs) are carried out to compare microscopic results with porous media models. The simulation of a microscopic flow that develops through a porous medium of 55, 75 and 95% porosity formed by staggered square cylinders is presented to that purpose. A laminar steady flow regime ($1 < Re < 150$) is considered together with Péclet numbers in the 10-103 range. The macroscopic porous media model is shown to be in excellent agreement with results obtained averaging microscopic numerical results.