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**Oscillation-Free Methods for Modeling Fluid-Porous Interfaces Using Segregated Solvers on Unstructured Grids** MILOS STANIC, University of Twente, MARKUS NORDLUND, ARKADIUSZ KUCZAJ, Philip Morris International R&D, Philip Morris Products S.A., EDOARDO FREDERIX, BERNARD GEURTS, University of Twente — Porous media flows can be found in a large number of fields ranging from engineering to medical applications. A volume-averaged approach to simulating porous media is often used because of its practicality and computational efficiency. Derivation of the volume-averaged porous flow equations introduces additional porous resistance terms to the momentum equation. When discretized these porous resistance terms create a body force discontinuity at the porous-fluid interface, which may lead to spurious oscillations if not accounted for properly. A variety of numerical techniques has been proposed to solve this problem, but few of them have concentrated on collocated grids and segregated solvers, which have wide applications in academia and industry. In this work we discuss the source of the spurious oscillations, quantify their amplitude and apply interface treatments methods that successfully remove the oscillations. The interface treatment methods are tested in a variety of realistic scenarios, including the porous plug and Beaver-Joseph test cases and show excellent results, minimizing or entirely removing the spurious oscillations at the porous-fluid interface. This research was financially supported by Philip Morris Products S.A.

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