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The filtered description of momentum transfer in continuum type gas-solid flow models JURAY DE WILDE, Université Catholique de Louvain — Whereas in the non-filtered continuum gas-solid flow models, momentum transfer is described by the drag force and the solid volume fraction of the gas phase pressure gradient, the description of momentum transfer in a filtered way is not yet fully understood. An apparent drag force approach is often proposed. It is shown that the unacceptable linear wave propagation speed behavior obtained with an apparent drag force approach can be corrected by an appropriate apparent distribution of the filtered gas phase pressure gradient over the phases. As coarser meshes are used, the microscopic drag force type description of gas-solid momentum transfer should be progressively replaced by a more macroscopic description that basically consists of distributing the filtered gas phase pressure gradient, the ultimate macroscopic driving force of both the phases, over the phases. The linear wave propagation speed behavior and the reformulation of the generalized added mass learn that the latter can guarantee an appropriate apparent distribution of the filtered gas phase pressure gradient over the phases for a given apparent drag force. This suggests the use of a generalized added mass closure model approach to completely describe filtered gas-solid momentum transfer, that is including both the filtered drag force and the correlation between the solid volume fraction and the gas phase pressure gradient.

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