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**On Self-Similarity of Turbulent Flows over Porous Media** ARIANE PAPKE, Max Planck Institute for Dynamics and Self-Organization, ILENIA BATTIATO, Clemson University — Coupled flows through and over porous layers occur in a variety of natural phenomena, biological systems and industrial processes. Some examples include turbulent flows over sediment beds, urban canopies, polymer brushes and packed-bed heat exchangers. Though such systems span a broad range of spatial scales, recent experiments [Ghisalberti, 2009] suggest the existence of a self-similar behavior. In this work we employ a two-domain approach to model flow through and over a porous medium: it couples the Reynolds with the Darcy-Brinkman equation, and allows one to derive analytical expressions of relevant quantities, such as interfacial velocity and drag length scale, just to mention a few. The connection between our analytical results and experimental data is discussed.

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