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Core formation by porous flow allowed by hysteresis in melt network topology SOHEIL GHANBARZADEH, MARC HESSE, MASHA PRODANOVIC, The University of Texas at Austin — The formation of the core via percolation is an attractive process to form planetary cores early in the planets evolution. There is currently a debate whether the ratio of interfacial forces between solid-solid and solid-liquid interfaces, imposing the dihedral angle between the solid grains and the pore fluid, in an olivine-melt matrix allows the formation of a percolating network. We present first computations of equilibrium melt distributions in realistic irregular grains and show that the percolation threshold at dihedral angles above 60 degrees is significantly larger than those previously reported for simple geometries. However, given typical compositions of the terrestrial planets initial porosities after the onset of melting of iron are large, 20-40threshold to form a connected melt network. As the porosity decreases due to melt segregation the network remains connected and allows core formation by porous flow. Only as the porosities approach 1and the iron become isolated in pockets along triple junctions. This residual iron may provide an explanation for the formation of dense layers near the core mantle boundary such as ”

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