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Main gas particle transport in RFP helical equilibria FULVIO AURIEMMA, Consorzio RFX, Ass. EURATOM-ENEA sulla Fusione 35127 Italy, WILLIAM BERGESON, Department of Physics and Astronomy, UCLA, California 90095, BRETT CHAPMAN, Department of Physics, UW, Madison, Wisconsin 53706, WIEXING DING, DAVID BROWER, Department of Physics and Astronomy, UCLA, California 90095, LORELLA CARRARO, PAOLO INNOCENTE, Consorzio RFX, Ass. EURATOM-ENEA sulla Fusione 35127 Italy, LIANG LIN, Department of Physics and Astronomy, UCLA, California 90095, RITA LORENZINI, BARBARA MOMO, DAVID TERRANOVA, Consorzio RFX, Ass. EURATOM-ENEA sulla Fusione 35127 Italy — Self organized helical states, where the innermost resonant tearing mode grows to large amplitude, routinely appear in all the RFP machines. With a sufficiently large dominant mode, the plasma's original magnetic axis is replaced with a new helical axis, bringing about the single helical axis (SHAx) state. A 3D magnetic topology can thereby occur in a toroidally axisymmetric device and this topology has been shown in RFX-mod (the Italian RFP) to exhibit improved energy confinement features (τ_E increases more than a factor 3) and beneficial effects on particle confinement, too. In this work, we will compare the main gas particle transport in SHAx plasmas in RFX-mod and MST. This analysis is based in part on multi-chord measurements of the density profile and modeling with the ASTRA code, accounting for the helical topology of the magnetic surfaces in the core.

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