

Abstract Submitted
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Neoclassical transport in the helical Reversed-field pinch GIAN-LUCA SPIZZO, MARCO GOBBIN, LIONELLO MARRELLI, Consorzio RFX, Padova - Italy, ROSCOE B. WHITE, Plasma Physics Laboratory, P.O.Box 451, Princeton, NJ 08543 — Test particle evaluation of the diffusion coefficient in a fusion plasma in the reversed-field pinch (RFP) configuration shows distinct similarities with Stellarators when the plasma spontaneously evolves towards a helical shape with reduced magnetic chaos. In particular, we recover the classical Tokamak and Stellarator transition from the banana to the plateau and Pfirsch-Schlüter regimes. The almost total absence of helically trapped (“superbanana”) particles with the values of q typical of the RFP ($|q| < 0.16$) and at the levels of helical deformation seen in experiment ($B_h/B = 10\%$) causes transport to be proportional to collision frequency (at low collisions). This fact excludes the possibility that the minimum conceivable transport could be inversely proportional to collision frequency, which is typical of un-optimized Stellarators. This result strengthens the perspectives of the helical RFP as a fusion configuration.

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