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Neoclassical transport in the helical Reversed-field pinch G. SPIZZO, M. GOBBIN, L. MARRELLI, Consorzio RFX, Padova - Italy, R.B. WHITE, Plasma Physics Laboratory, P.O.Box 451, Princeton, NJ 08543 — In this work we study particle transport in the Reversed-Field Pinch magnetic field topology. The guiding centre test particle code ORBIT is used. We find that passing particles, which in the chaotic multiple helicity (MH) state experience long-correlation Lévy flights, in the low-chaos, Single Helical Axis (SHAx) regime [1] remain well confined within magnetic surfaces. Residual diffusion is given by trapped particles and the associated neoclassical diffusion coefficient D is explored as a function of collisionality. Helically trapped (superbanana) particles appear to provide negligible contribution [2]. As a result, we recover the classical Tokamak and Stellarator transition from the banana to the plateau and Pfirsch-Schlüter regimes, but without the $1/\nu$ dependence at low collisionality which is typical of the un-optimized stellarator.

[1]R.Lorenzini, E.Martines, P.Piovesan *et al*, Nature Physics in press
[2]M. E. Puiatti, In *Proc. of the 36*th *EPS Conference on Controlled Fusion and Plasma Physics, Sofia (Bulgaria), 29 June- 3 July, 2009*

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