Abstract Submitted
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Nonlocal Lévy flight transport in the RFX G. SPIZZO, Consorzio RFX, Padova, Italy, R.B. WHITE, Plasma Physics Laboratory, P.O. Box 451, Princeton, NJ 08543, S. CAPPELLO, L. MARRELLI, Consorzio RFX, Padova, Italy — Particle transport in a toroidal plasma confinement device has been shown to be non-diffusive when magnetic chaos is present[1]. The effect is illustrated by numerical modelling of the magnetic structure and associated particle transport in conditions relevant for the reversed-field pinch experiment at the Consorzio RFX, Padova, Italy. A nonlocal Montroll equation, modified to take account of causality, inhomogeneity, finite boundaries and the very different behavior of trapped and passing particles is used to model this transport. The necessary input to the Montroll equation consists of a generalized distribution (kernel) of Lévy flight times and distances $p(r', r - r'; t - t')$. A guiding center code is used to numerically construct this function, and the Montroll equation is used to examine the transport. The Montroll equation is found to reproduce the observed subdiffusive transport as well as the associated phenomenological pinch effect.

[1]G. Spizzo, R. B. White and S. Cappello, Phys. Plasmas **14**, 102310 (2007)

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