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Turbulence and transport in a 3D magnetic boundary MATTEO AGOSTINI, LORELLA CARRARO, GIOVANNI CIACCIO, GIANLUCA DE MASI, CRISTINA REA, PAOLO SCARIN, GIANLUCA SPIZZO, MONICA SPOLAORE, NICOLA VIANELLO, Consorzio RFX — In present fusion devices the interaction between 3D magnetic field, edge kinetic properties and turbulence is a crucial issue; not only in intrinsically 3D configurations such as the stellarators, but also in tokamaks, where magnetic perturbations are applied to control ELMs and plasma wall interaction. In the RFX-mod reversed field pinch the spontaneous development at high plasma current of a helical magnetic state displays strong analogies with the aforementioned configurations. At the edge the presence of a stochastic layer and magnetic islands with a well-defined helical symmetry leads to a helical pattern of flow, pressure gradients and turbulent fluctuations: larger fluctuations and shorter correlation lengths are observed near the X-point of the magnetic island, where also a flow slowing-down occurs. Aim of this work is to study the effect of edge turbulence on particle transport in a 3D magnetic boundary, characterizing the properties of the edge blobs along the helical deformation. The magnetic topology also modifies kinetic properties, with higher pressure gradients observed close to the O-point of the island. The measurement of the time evolution of pressure gradient and blob characteristics, can clarify the mutual relation between these two quantities.

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