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Half - Quantum Vortices in the polar phase of He-3 in nematic aerogel

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Unlike to superfluid He-4 the superfluid He-3A support the existence of vortices with half quantum of circulation as well as single quantum vortices. The singular single quanta vortices as well as nonsingular vortices with 2 quanta of circulation have been revealed in rotating He-3A. However, the half quantum vortices in open geometry always possess an extra energy due to spin-orbit coupling leading to formation of domain wall at distances larger than dipole length from the vortex axis. Fortunately the same magnetic dipole-dipole interaction does not prevent the existence of half-quantum vortices in the polar phase of superfluid He-3 that can be realized in peculiar porous media "nematically ordered" aerogel. Here we discuss this exotic possibility.