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**Effect of the sample geometry on the intermediate state in mesoscopic 3D Type-I superconductors** GOLIBJON BERDIYOROV, Departement Fysica, Universiteit Antwerpen, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium, ALEXANDER HERNANDEZ, Centro Atómico Bariloche, 8400 San Carlos de Bariloche, Río Negro, Argentina, FRANCOIS PEETERS, Departement Fysica, Universiteit Antwerpen, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium —
The intermediate state (IS) of type-I superconductors (SC) has recently became a topic of increasing interest [1,2]. Direct imaging of type-I SC reveals two distinct topologies of the intermediate state: flux tubes are formed upon magnetic field penetration and laminar patterns appear upon flux exit [2]. However, spheres and cones show no hysteresis with flux tubes dominating the IS [1]. In this work we investigate the effect of the sample topology on the formation of the flux patterns in mesoscopic type-I SC using the phenomenological Ginzburg-Landau theory. We carry out simulations on three-dimensional samples of different geometries. We show that in the samples with sharp boundaries (cubes and disks) laminar structures are mostly located along the boundary, whereas radial distribution of the flux patterns is obtained for cones and spheres. The effect of the edge defects on the observed structures will also be studied. [1] R.Prozorov, Phys. Rev. Lett. **98**, 257001 (2007). [2] M. Menghini et al., Phys. Rev. B **75**, 014529 (2007).

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