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Thermal Fluctuations of Vortex Matter in Trapped Bose-Einstein Condensates STEINAR KRAGSET, Norwegian University of Science and Technology, EGOR BABAEV, Royal Institute of Technology, Sweden, ASLE SUDBO¹, Norwegian University of Science and Technology — We perform Monte Carlo studies of vortices in three dimensions in a cylindrical confinement, with uniform and nonuniform density. The former is relevant to rotating 4He, the latter is relevant to a rotating trapped Bose-Einstein condensate. In the former case we find dominant angular thermal vortex fluctuations close to the cylinder wall. For the latter case, a novel effect is that at low temperatures the vortex solid close to the center of the trap crosses directly over to a tension-less vortex tangle near the edge of the trap. At higher temperatures an intermediate tensionful vortex liquid located between the vortex solid and the vortex tangle, may exist.

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