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LBM Simulations for the Head-on Collisions of Vortex Pairs and Vortices-Wall Interactions in Two Dimensions[1] YUXIAN XIA, Institute of Applied Mathematics and Mechanics, Shanghai University, Shanghai 200072, YUEHONG QIAN, Institute of Applied Mathematics and Mechanics, Shanghaqi University, Shanghai, 200072 — Vortex dynamics has been studied in two dimensions with lattice Botzmann method for the basic interactions of vortices. With different off-center distances the head-on collisions of two equal pairs of vortices(two dipoles) different regimes have been found: exchanging, merging and diffracting. Meanwhile the interactions of a vortex dipole with solid wall have been also investigated and comparison with existing experiments has been shown certain agreement. More complicated cases for three dimensions are left for future works.

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