Effective mass and superfluid fraction in a periodic ultracold Bose gas with long-range interaction[1] CHE-HSIU HSUEH, Department of Physics, National Taiwan Normal University, Taiwan, YU-CHING TSAI, Department of Physics, National Taiwan Normal University and Department of Physics, National Changhua University of Education, Taiwan, WEN-CHIN WU, Department of Physics, National Taiwan Normal University, Taiwan — The scheme that superfluid fraction $f_s = \rho_s/\rho$ is equal to the ratio of bare to effective mass m/m^* of the particles is applied to investigate the superfluid-supersolid (SF-SS) transition in a periodic ultracold Bose gas with long-range interaction. We consider both the Rydberg-dressed Bose gas with tunable blockade radius and coupling constant and the dipolar Bose gas with controllable coupling constant and polarization. Both the strong and week lattice limits are investigated.

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