Contributed Talk

Exploring Vortex Droplets in Two-Dimensional Harmonic Traps: A Photonic Spin-Orbit Coupling Perspective

S. Sanjay and S. Saravana Veni

Department of Physics, Amrita School of Physical Sciences, Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India

We theoretically investigate the formation of array of spatially periodic vortex droplets under two- dimensional harmonic potential in the presence of TE-TM splitting, using mean-field model. The number of vortex droplets formed in the harmonic trap is proportional to interaction coefficients. Depending upon the atomic interactions ring, circular pattern of vortex droplets are generated with the central site remains vacant. Investigating the influence of TE-TM strengths under polariton- polariton interactions enables the experimentalists to examine novel material systems and evaluate Photonics and Integrated Circuits. Our findings indicate the emergence of a self-bound state due to TE-TM splitting and atomic interactions, making it an exemplary option for future experimental observation. Keywords:Vortex, Transverse Electric and Magnetic field (TE-TM) splitting, Vortex droplets(VDs)