

Mathematics of Super-resolution in Resonant Media

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The speaker and his group develop a mathematical theory to explain the mechanism of super-resolution in resonant media which consists of sub-wavelength resonators. Examples include Helmholtz resonators, plasmonic particles, and bubbles. For the media consisting of small finite number of resonators, they show that super-resolution is due to sub-wavelength propagating modes; for the case of large number of resonators, they derive an effective media theory and show that super-resolution is due to the effective high contrast in the wave speed.