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Sub-nanoscale Resolution for Microscopy via Coherent Population Trapping KISHOR T. KAPALE, Western Illinois University, Macomb, Il 61455, GIRISH S. AGARWAL, Oklahoma State University, Stillwater, OK 74078 — We present a coherent population trapping based scheme to attain sub-nanoscale resolution for microscopy. Our method uses three-level atoms coupled to amplitude modulated probe field and spatially dependent drive field. The modulation of the probe field allows us to tap into the steep dispersion normally associated with electromagnetically induced transparency and offers an avenue to attain sub- nanometer resolution using just optical fields. We illustrate application of the techniques to the area of microscopy, show how multilevel schemes offer the possibility of improving resolution further, and discuss extensions beyond single spatial dimension.

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