

## Non-Diffractive Tractor Beams - DTU Orbit (09/11/2017)

### Non-Diffractive Tractor Beams

Pulling optical force discovered recently in the theory and experiment has drawn great attention owing to its counterintuitive nature and promising applications. Pulling force originates from the enhanced forward light scattering that in accordance with the momentum conservation conveys light momentum to particles in the backward direction. The amplified forward scattering is achieved through the interaction of multipoles, conventionally electric and magnetic dipole moments. In this talk we give an overview of the tractor beams in optics, acoustics, classical and quantum mechanics. We demonstrate how to ease the conditions required in experiment for realization of the optical tractor beams using the cylindrical objects. We pay a particular attention to the case of the pulling optical force due to the interaction of magnetic dipole and quadrupole moments.

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