

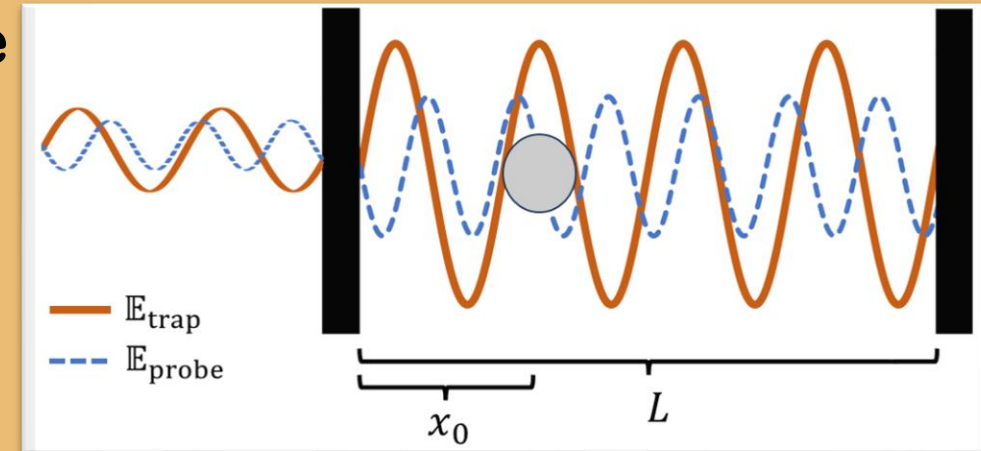
# Non-perturbative Levitated Sensor Systems for Gravitational Wave Detection

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## • *Part One: Relativistic Derivation of GW Response*

- Demonstration of gauge-invariance in the GW-driven force on a dielectric sensor levitated in a Fabry-Perot cavity
- Discussion on asymmetry in response and noise coupling hierarchies

• [arXiv:2604.07302](https://arxiv.org/abs/2604.07302)



## • *Part Two: Nonperturbative Optical Effects*

- Implementation of BCs for large sensors into full field equations
- Analysis of effect on optical fields propagating in the experiment
- Considerations for cavity locking, impact of locking on system behavior