

# Using axion mini-clusters to disentangle the axion-photon coupling and the dark matter density

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Dark matter direct (and indirect) detection experiments usually can only determine a specific combination of a power of the coupling and the dark matter density. This is also true for axion haloscopes which are sensitive to the product  $g^2\rho$ , the combination of axion-photon coupling squared and the dark matter density. We show, that in the lucky case when we intersect with a so-called minicluster of a suitable size, we can utilize the spectral information available in haloscopes to determine the gravitational potential of the mini-cluster. We can then use this to separately measure coupling and density of the mini-cluster.

**Primary author(s)** : Prof. JAECKEL, Joerg; MONTOYA, Valentina; DANDOY, Virgile (Karlsruhe Institute for Technology)

**Presenter(s)** : DANDOY, Virgile (Karlsruhe Institute for Technology)