



Contribution ID: 15

Type: **not specified**

Dark photon superradiance

I will describe the electrodynamics of a kinetically mixed dark photon cloud that forms through superradiance around a spinning black hole, and outline strategies to search for the resulting multi-messenger signals. A dark photon superradiance cloud sources a rotating dark electromagnetic field which, through kinetic mixing, induces a rotating visible electromagnetic field. Standard model charged particles entering this field initiate a transient phase of particle production that populates a plasma inside the cloud, which ultimately powers strong electromagnetic emissions. These emissions are expected to have a significant X-ray component and potentially be periodic, with period set by the dark photon mass. The luminosity is comparable to the brightest X-ray sources in the Universe, allowing for searches at distances of up to hundreds of Mpc with existing telescopes.

Presenter: SIEMONSEN, Nils

Session Classification: Morning session-1