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Lightning Broadband Radio Interferometry at the Pierre Auger Observatory

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Previous efforts at the Pierre Auger Observatory have shown that lightning related phenomena can be picked up by, and affect, each of its detector systems. Therefore as part of its monitoring, a system has been rolled out to detect thunderstorm conditions, enabling the investigation of thunderstorms and lightning using the Observatory's hybrid detectors.

As a successful testbed for air shower measurements using radio detectors, the Auger Engineering Radio Array (AERA) is a direct precursor to the Radio Detector package of the AugerPrime upgrade that is currently in deployment. To expand the existing lightning detection infrastructure, we aim to repurpose a subset of AERA stations and strategically redistribute them within the Auger field to establish a precision interferometric lightning physics facility.

In this contribution, I will present the interplay between thunderstorms and air shower physics and the motivation for further developing such lightning facilities.

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