

Expected performance of interferometric air-shower measurements with radio antennas

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What: Investigate newly proposed **interferometric X_{\max} reconstruction** for inclined air showers with **realistic detector**, i.e., with realistically spaced antenna arrays with **imperfect time synchronisation**.

Why: Inclined air showers, enable detection of cosmic ray with the radio technique at the highest energies, an **accurate X_{\max} reconstruction perfectly complements muon-electron separation** provided by a hybrid particle-radio detector **providing excellent mass sensitivity**.

How: Simulations with varying detector layout, i.e., antenna spacing / antenna multiplicity and realistic time resolution by adding gaussian time jitter σ_t .

Results: Antenna multiplicity crucial for measurements with imperfect time synchronisation. Accurate reconstruction ($\sigma_{X_{\max}} \lesssim 20 \text{ g/cm}^2$) with $\sigma_t = 1\text{ns}$ only possible with large number of stations $n_{\text{ant}} \gtrsim 50$ (for 30 – 80 MHz). No improvement at higher frequencies.

