

# Electrical signals induced in detectors by cosmic rays: a reciprocal look at electrodynamics

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The method of “weighting fields” gives an efficient way to compute the signal produced in a detector by a passing charged particle. Originally based on (quasi-)electrostatic approximations, this so called Ramo-Shockley theorem is heavily used to calculate signals in detectors based on ionisation, like gas detectors or silicon sensors. I will present an extension of the method to encapsulate the full extent of Maxwell’s equations, which renders it applicable to all devices that detect fields and radiation from charged particles. I will discuss possible applications of this method for the experimental study of cosmic rays, including consequences for the modelling of the detector signal produced by atmospheric showers.

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## Keywords

atmospheric shower; electric signal; radio; simulation; modelling; radiation;

## Collaboration

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## Subcategory

Experimental Methods & Instrumentation

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