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## New Developments in the GENFIT track fitting framework

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GENFIT is a framework for track fitting in nuclear and particle physics. Its defining feature is the conceptual independence of the specific detector and field geometry, achieved by modular design of the software.

A track in genfit is a collection of detector hits and a collection of track representations. It can contain hits from different detector types (planar hits, space points, isochrones from wire detectors) in their natural coordinates. The track representations define the extrapolation through the detector material and field configuration. Several track representations are available and can be easily exchanged or complemented with new models. Different representations (e.g. for different particle hypotheses) can be fitted simultaneously.

Its application in different collaborations (e.g. PANDA, Belle II, COMPASS) has sparked new developments and improvements. The fitting routines have been upgraded with algorithms for hit smoothing. A Deterministic Annealing Filter (DAF) has been implemented, tested and validated. Due to a new interfacing with the RAVE vertexing framework developed for CMS, GENFIT is now capable of vertex reconstruction and fitting. Furthermore, GENFIT has been complemented with built-in capabilities for event display, allowing direct visual validation of fit results.

Results from simulation tests and physics data will be presented.

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