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Reconstruction of short-lived particles with the KF Particle Finder package in the CBM experiment

Short-lived particles that have very small production probability or small branching ratio of the channel suitable for registration are of particular interest in the future heavy-ion experiment CBM at FAIR. Such particles can be reconstructed and investigated only through their decay products.

The KF Particle Finder package was developed for reconstruction and selection of short-lived particles produced in the collisions. More than 100 decay channels of short-lived particles are included to the reconstruction scheme. The package covers signals from most of the physics cases of the CBM experiment: strange particles, strange resonances, hypernuclei, low mass vector mesons, charmonium, and open-charm particles.

Reconstruction of particles is based on the Kalman filter mathematics, that provides high quality of the obtained parameters and their errors. Also, the mathematics includes the mass and topological constraints, which are of particular importance for reconstruction of decay trees like multi-strange hyperons and resonances. The package is geometry independent, that makes it a universal platform for short-lived particles reconstruction and physics analysis.

Preferred Track

Future Experimental Facilities, Upgrades, and Instrumentation

Collaboration

Other

Primary author: Dr ZYZAK, Maksym (GSI)

Co-author: Dr VASSILIEV, Iouri (GSI)

Presenter: Dr ZYZAK, Maksym (GSI)

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