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Tracking of long lived hyperons in silicon detector at CDF.

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Long lived charged hyperon, Ξ and Ω, are capable of travelling significant distances producing hits in the silicon detector, before decaying into $\Lambda^0\pi$ and $\Lambda^0 K$ pairs, respectively. This gives unique opportunity of reconstructiong hyperon tracks. We have developed a dedicated "outside-in" tracking algorithm that is seeded by 4-momentum and decay vertex of the long lived hyperon reconstructed by its decay products.
The tracking of hyperons in the silicon detector results in a dramatic reduction of the combinatorial background and an improvement of the momentum resolution compared with the standard reconstruction using final decay products.

Using a super clean sample of Ξ hyperons CDF observed charmed-strange baryon isodublet Ξ_c^0 and Ξ_c^+ for the first time in $p\bar{p}$ collision.
Ξ hyperons were used for the search for exotic $S = -2$ baryons decaying into $\Xi\pi$.

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