Subject: entries at unphysical mass after vertex fit
Posted by Albrecht Gillitzer on Thu, 04 Dec 2014 09:17:53 GMT
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Hi all,

When comparing the Lambda mass spectrum evaluated before and after the vertex fit using PndKinVtxFitter, one can see that the fwhm of the Lambda mass distribution improves by the vertex fit but in contrast larger tails in the mass distribution are created. On the low mass side the tails extend far into the unphysical region at masses below the sum mass of the daughter particles M_sum = m_pi + m_p.
The attached plot has been generated from 10000 events 4 GeV/c pbar p --> Xibar+ Xi- (PHSP) --> Lambdabar pi+ Lambda pi- --> pbar pi+ pi+ p pi- pi- with the oct14 release. Upper row: Lambda mass before vertex fit / Lower row: after vertex fit // Left: lin y axis / Right: log y axis.
The corresponding plot for Lambdabar shows the same feature. Simulation and analysis of the same reaction with the scrut14 release also shows the same feature.

My interpretation: Can it be that in the vertex fit the 3-momenta of the daughter particles are modified according to the modified track parameters as a result of the fit, but their energies are left unchanged? As a consequence the energy momentum relation would be destroyed and particles no longer would have the correct mass value.

Albrecht

File Attachments

1) LambdaMass_4p.pdf, downloaded 469 times