Subject: MisID vs Impurity Posted by Klaus Götzen on Wed, 21 Nov 2012 14:48:34 GMT View Forum Message <> Reply to Message

Dear all,

since my mic died during the EVO meeting yesterday, I'll try to explain what I wanted to say concerning misID and impurity.

The issue I wanted to point out is, that the impurity is a quantity which is not independent of the fluxes, whereas the misID is. The misID is the fraction of false positive identified particles of a certain species. E.g. the pion-misID of a kaon selector is

misID(pi|K) = #selected pi / #total pi

Obviously this quantity is flux independent, since the flux would go into nominator and denominator. Please note, that there is not information about the selected number of kaons in this quantity, although it is a property of the kaon selector. It's just the probability for another particle species to be accepted by the kaon selector.

On the other hand the impurity is defined as

impurity(pi|K) = 1 - purity = 1 - #sel. K / (#sel. pi + #sel. K) = #sel. pi / (#sel K + #sel pi)

First of all, these two things are different quantities. The other issue is, that a change in relative fluxes would change the impurity (as well as the purity of course), since (with F being the relative pi/K flux factor change in the upper equation)

impurity = F·#sel pi / (#sel. K + F·#sel pi) != #sel. pi / (#sel K + #sel pi)

I think the quality measure of a particular selection algorithm should not depend on the current physical environment (like relative fluxes).

Of course I'm open for discussions in that respect.

Cheers, Klaus