News on the D*lν Mixing Analysis

Martino 9/12/03

End of July Status:

- MC fit procedure stable since La Biodola Meeting:
Side Band+Mass Band fit to determine simultaneously the combinatorial/cascade leptons/signal parameters;
- DT fit procedure (as MC fit + continuum lifetime and bias): convergence problems.

Improvements:

- Some bugs discovered in the determination of the DT sample composition $F(m^2\nu)$ (different event selection w.r.t final fit);
- Improved iterative procedure for $\alpha(\cos\theta_{l\pi})=D_{tag}/(D_{tag}+B_{tag})$ computation assuming:

$$\alpha^{B+}_{DT,fit} / \alpha^{B+}_{MC} = \alpha^{B0}_{DT,fit} / \alpha^{B0}_{MC}$$

- Rearrangement of the free parameters set in the combinatorial PDF

($\tau(D^0)_{BKG} = \tau(D^0)_{SIGN}$; $F^{mix}(B^+_{BKG}) = 0$; free $\rho(B^0)_{BKG}$).

→ Fit statistical error on $\tau(B^0)$, Δm is now in ~agreement with the MC expectation rescaled to DT statistics (Run1 sample):

	$\delta(\tau_{B0})_{STAT}$ (ps)	$\delta(\Delta m)_{STAT}$ (ps^{-1})
MC	.0111	.0075
DT	.0128	.0090

Difference due to the Continuum lifetime and bias fitted on DT, but not determined in MC fit.

Current Activity: Fit Validation

- Scan over the (τ, Δm) plane to check the likelihood behaviour around the minimum;
- Problem: the fit (blind) results seem to be slightly sensitive to the parameter starting point;

Plans:

- Define an iterative procedure to reach the fit stability (1−2 weeks);
- Perform a Toy MC study (2−3 weeks);
- Move to the 2001 MC/DT analysis (October);
- Study the Systematics.

Goal:

- Submit the paper by March 31 (in agreement with the Stage 1 plan)