Improvements in Fitting

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Improvements in Fitting

- Allow measurement types for restricted fits
- Modified rescaling of errors for fits with input correlations.
- Plot the results of a fit.

Allow measurement types for restricted fits

- For most measurements the measurement type is NULL and the measurement will be used in the same manner as it always was used.
- An example where measurement types are useful is in determing the K0L CP-violation parameters where we fit Φ_{+-}, Φ_{00}, $\Delta\Phi$, Δm, and τ_S.

- Here we have two fits:

  1. Assume CPT (type = 'CPT').

     Use all measurements

  2. Do not assume CPT (type = 'noCPT').

     Use only measurements that do not assume CPT.

- Measurements that do not assume CPT have type NULL and will be used in both fits.

  Measurements that assume CPT have type 'CPT' and will only be used in the CPT fit.

- However some measurements such as Alavi-Harati 2003 measure τ_S and Δm both assuming and not assuming CPT. For these measurements the measurement assuming CPT has type = 'CPT' and the measurement not assuming CPT has type = 'noCPT' since we do not wish to use it in the fit that assumes CPT.

Modified the rescaling of errors for fits with input correlations.

- When we rescaled errors because the fit was poor we initially rescaled all elements of the input error matrix.

  $R(ij) = S(i) * E(ij) * S(j)$

  where

  $E(ij)$ = original error matrix

  $R(ij)$ = rescaled error matrix

  $S(j)$ = scale factor

  However this produced results that improperly distorted the fit.

- Thus we now rescale only the diagonal errors.

$$R(ij) = E(ij) + D(ij)$$

where

$$D(ii) = (S(i)^2 - 1) * E(ii)$$

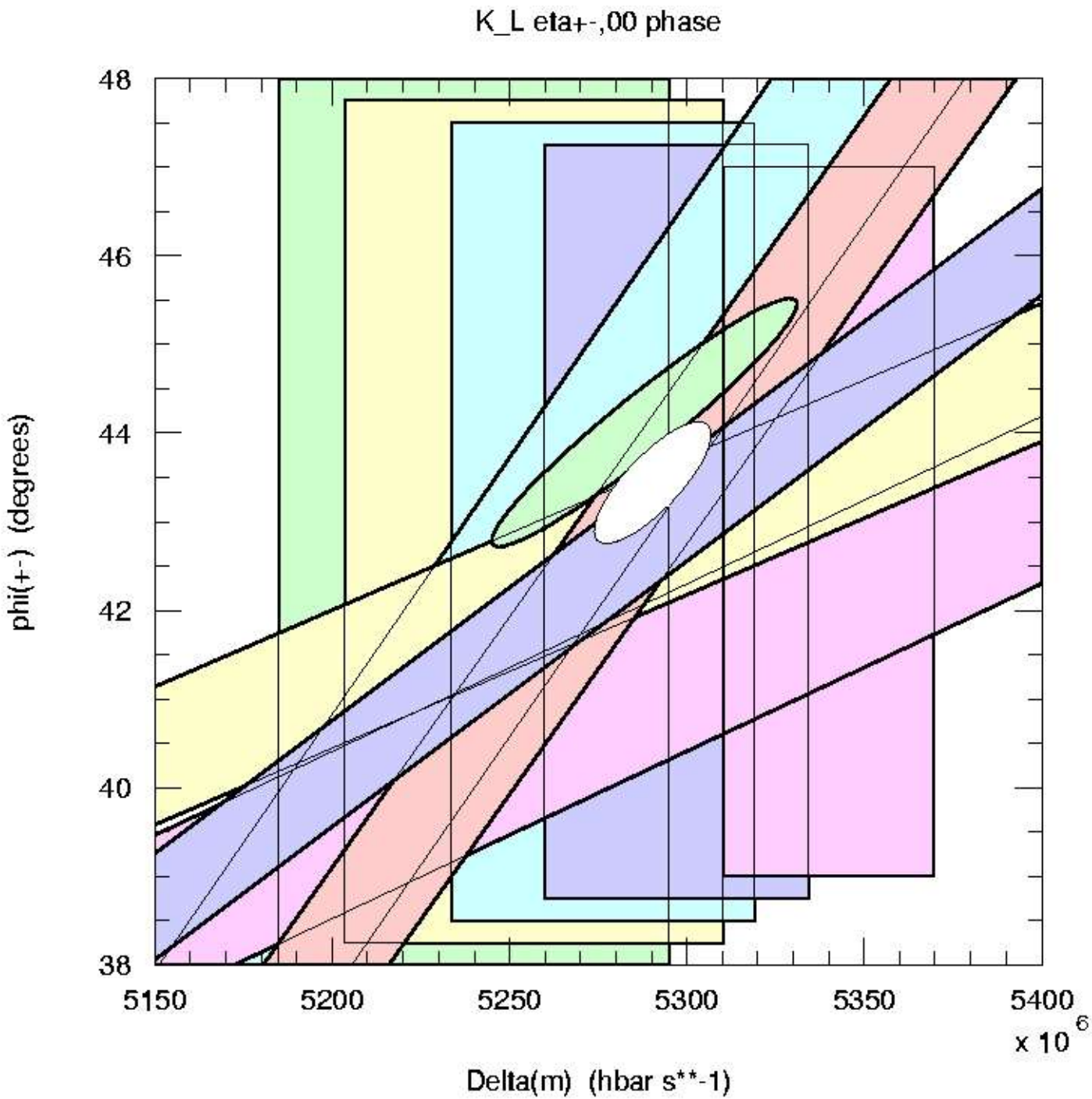
$$D(ij) = 0 \text{ if } i \neq j$$

Plot the results of a fit

- We now have a new program plotr that will plot the results of a fit extracting data directly from the database.

  The user must specify the fit and the two variables to plot. They can also specify the limits and tick separations for the axes.

- We previously had a plotting program similar to this but it did not use the databse and required the user to enter all data by hand for both a fit and a plot.


K_L eta+-,00 phase
48
46
44
42
40
38
phi(+-) (degrees)
5150
5200
5250
5300
5350
5400
x 10^6
Delta(m) (hbar s**-1)