Partial moments for $B^0 \to K^* \mu^- \mu^+$

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Full moments

- Work based on *arXiv:1506.03970* by Roman Zwicky and James Gratex.
- So to make long story short: if there is a discrepancy between MoM and LL due to physics missmodeling we should see it in the higher and partial moments.
- Let's work in Romans framework of notation:

$$I_{K^*} = \Re[G_0^{00}\Omega_0^{00} + G_0^{01}\Omega_0^{01} + G_0^{02}\Omega_0^{02} \tag{1}$$
$$+G_0^{20}\Omega_0^{20} + G_0^{21}\Omega_0^{21} + G_1^{21}\Omega_1^{21} \tag{2}$$
$$+G_0^{22}\Omega_0^{22} + G_1^{22}\Omega_1^{22} + G_2^{22}\Omega_2^{22}, \tag{3}$$

where

$$\Omega_m^{l_K,L_l} = \bar{D}_{m,0}^{l_K}\bar{D}_{m,0}^{l_l} \tag{4}$$

- This basis is just a linear combination of what we use in the paper. Nothin really fancy here

Partial moments

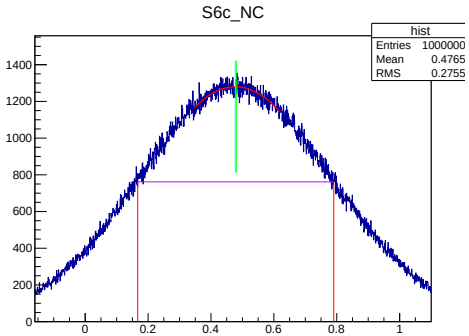
- Now the fun begins, when you leave one angle to float.
- We can define:

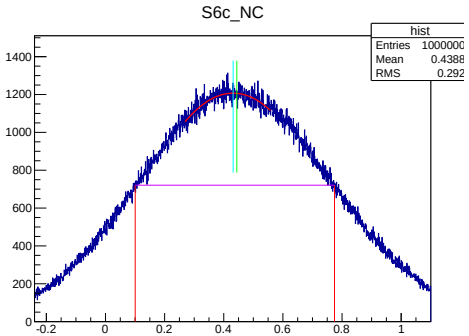
$$l_m^{l_k} \sim \sum_{l_l} \bar{D}_{m,0}^{l_l} \tag{5}$$

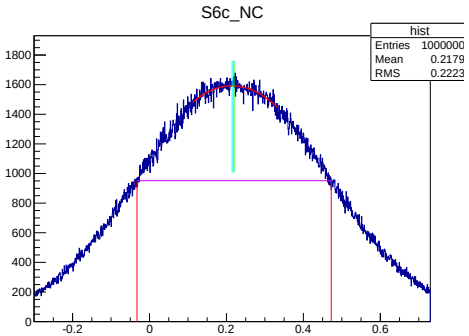
The $\bar{D}_{m,0}^{l_l}$ function depends here only on θ_K and ϕ.

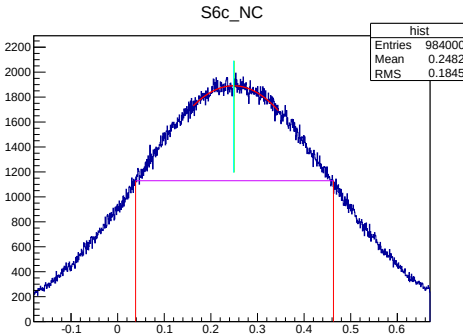
- Why is this importnant?

Beacuse on of thouse moments is euqal just to S_{6c}. And remember :



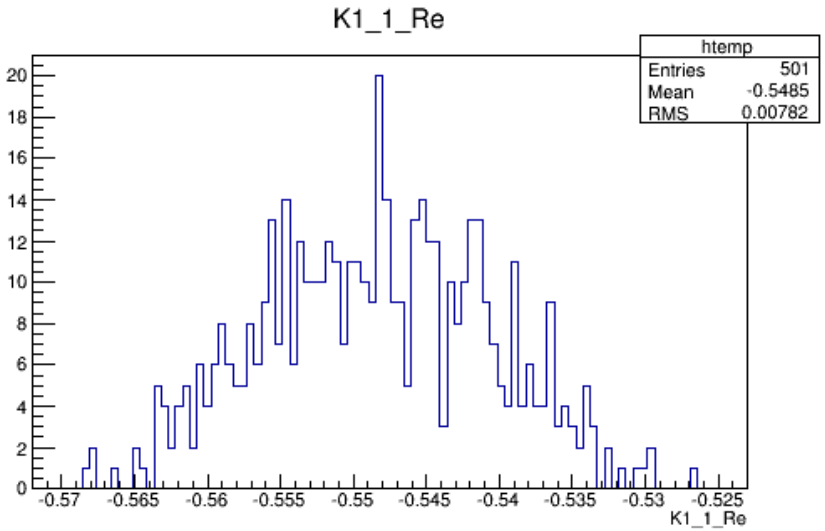


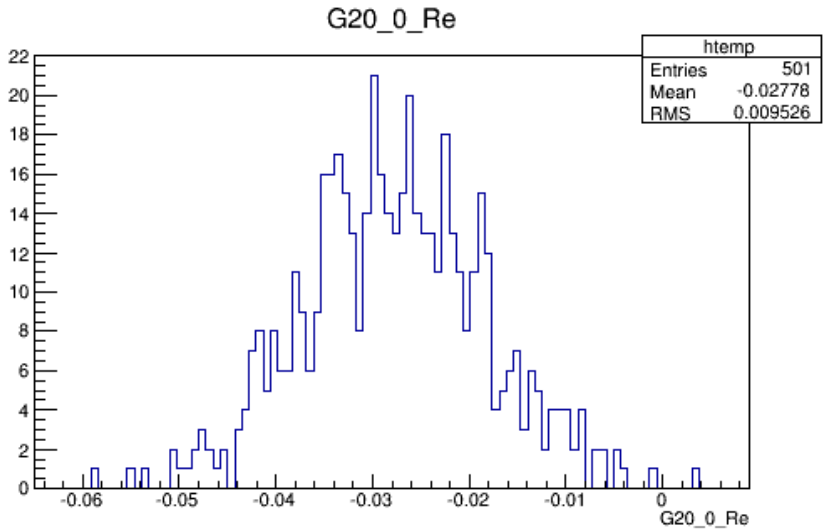




Partial moments toy studies

- I run some toys last night.
- The results look very promissing: On the raw moments the error on partial moments is smaller then on the normal moments.
- One needs to do the math but looks like we can gain sensitivity to certain observables.





Conclusions

- Work just started.
- Need to do all the math $\longrightarrow$ there might be many more relations :)
- If this turn out to gain any sensitivity to certain observables, this will be a super fast paper.

Backup