0.1 Non-Flat Background

We observe a significant non-femtoscopic, non-flat, background in all of our correlations at large k^*. This background increases with decreasing centrality, is the same amongst all $\Lambda K^{\pm}$ pairs, and is more pronounced in the ΛK^0_S system, as can be seen in Fig. 1.

It is important to note that the difference in $\Lambda K^{\pm}$ and ΛK^0_S backgrounds is due mainly to the difference in kinematic cuts, not due to any interesting physics. In simulation, which do a very good job of matching the experimental data, when restrictions are imposed on the p_T of the K^0_S to more closely match the $K^{\pm}$ cuts, the backgrounds align.

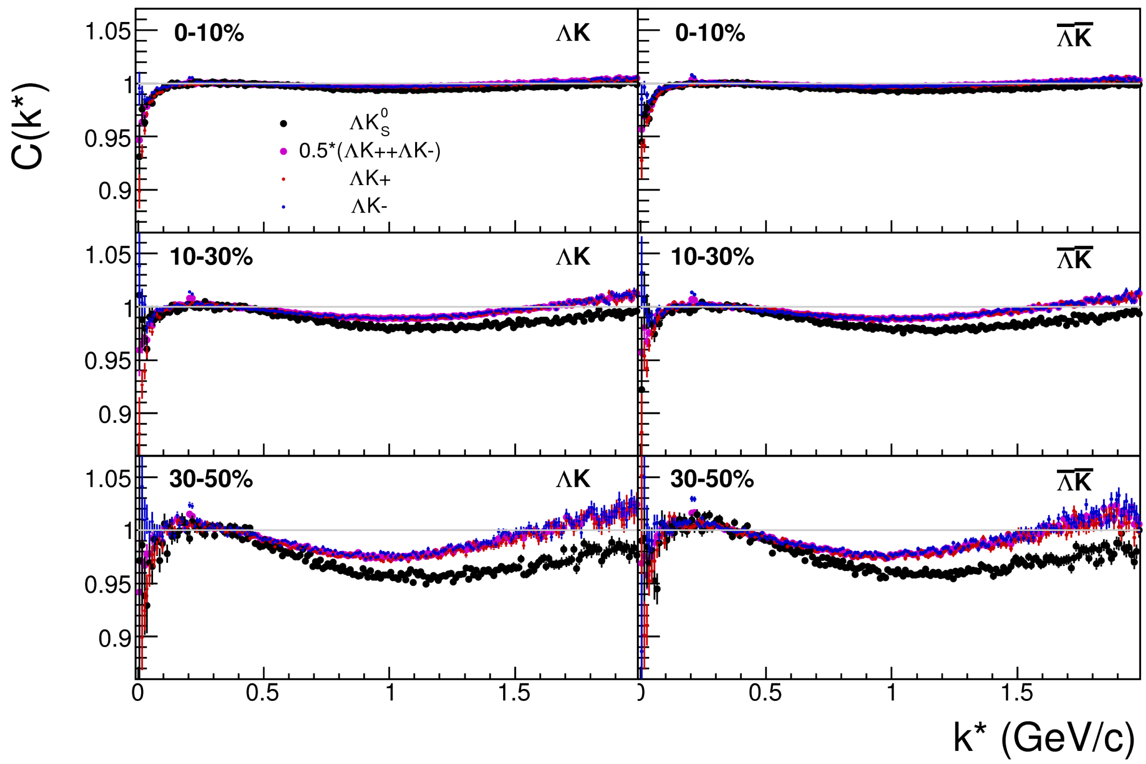
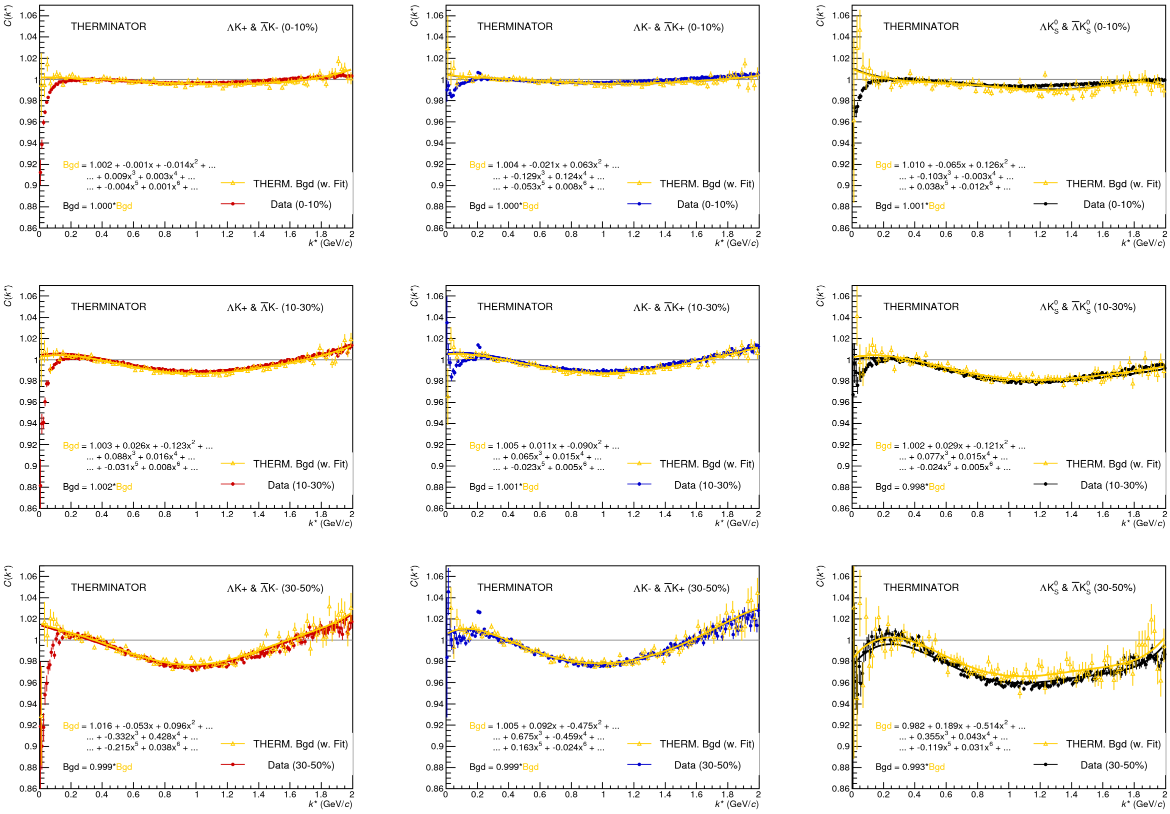


Fig. 1: Compare backgrounds

It is suggested that this background effect is due primarily to particle collimation associated with elliptic flow [?]. More specifically, these backgrounds result from mixing events with unlike event-plane angles (Ψ_{EP}). As explained in [?], when elliptic flow is present, all particles are more likely to be emitted in a specific direction (in-plane), as opposed to a perpendicular direction. Therefore, the difference in momenta for pairs of particles tends to be smaller, compared to the case of no flow. In the case of mixed-event pairs, the two events used do not share an event-plane, and therefore this is no collimation effect in the pairs from flow. As a result, pairs with larger momentum are more likely when mixed-events are used, and the correlation function will be observed below unity. In general, a dip below unity, at a given k^*, means it is more probable to find a pair at that k^* when the daughters are taken from mixed-events, as compared to when they are taken from the same event.

This same reasoning suggests that the background should lead to an enhancement at low-k^*. The enhancement at high-k^* ($k^* \gtrsim 1.5$ GeV/c) does not result from the collective flow of the system. We are not certain was causes this enhancement, but typical suspects are jet-like correlations and resonance decays.

We can split our correlation functions into three main regions. First, the low-k^* region ($k^* \lesssim 0.3$ GeV/c) contains the femtoscopic correlations, as well as a likely enhancement from the background. The intermediate-k^* region ($0.3 \lesssim k^* \gtrsim 1.5$ GeV/c) contains a suppression from the background. Finally, the high-k^* region ($k^* \gtrsim 1.5$ GeV/c) contains an enhancement with unknown origin.



(a) ΛK^{+} (b) ΛK^{-} (c) ΛK^{0}_{S}

Fig. 2: Backgrounds with THERMINATOR

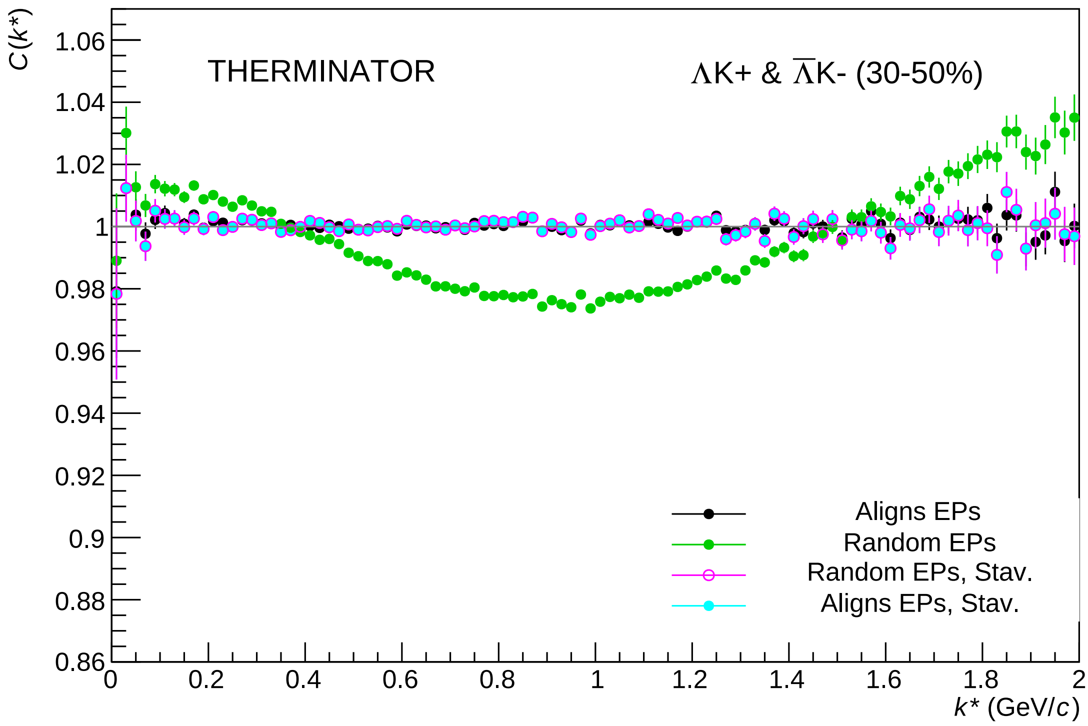


Fig. 3: Background reduction methods with THERMINATOR

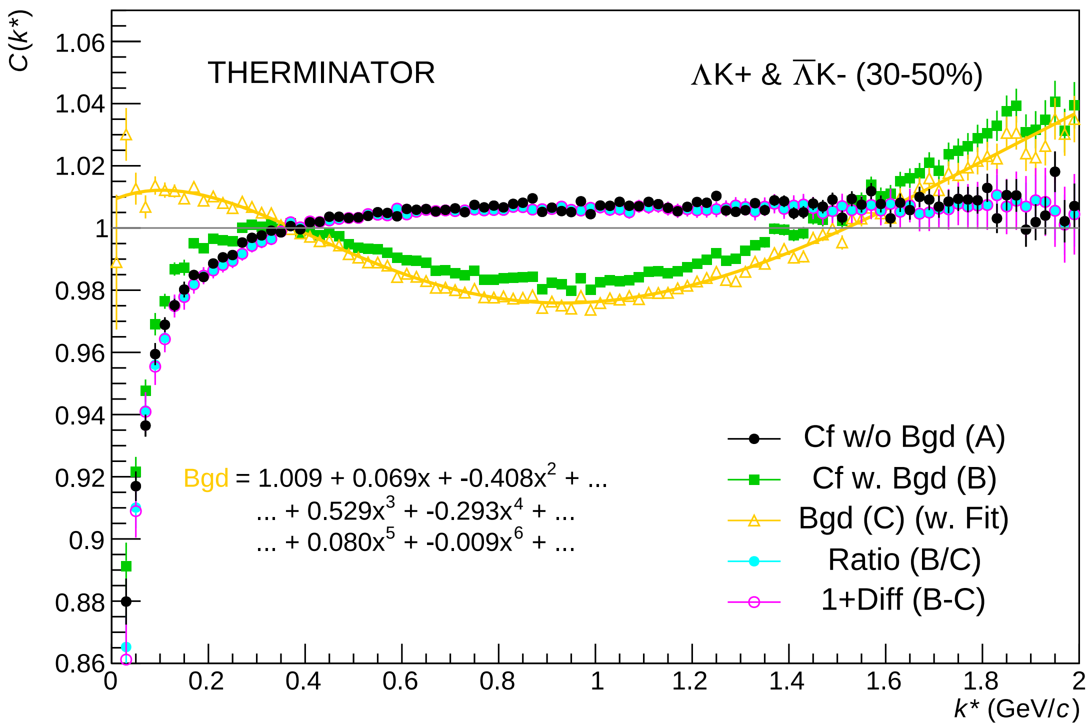


Fig. 4: Correlation with background decomposition with THERMINATOR