

0.1 Model: ΛK_S^0 , ΛK^\pm , $\Xi^{ch} K_S^0$

The two-particle relative momentum correlation function may be written theoretically by the Koonin-Pratt equation [?, ?]:

$$C(\mathbf{k}^*) = \int S(\mathbf{r}^*) |\Psi_{\mathbf{k}^*}(\mathbf{r}^*)|^2 d^3 \mathbf{r}^* \quad (1)$$

In the absence of Coulomb effects, and assuming a spherically gaussian source of width R , the 1D femtoscopic correlation function can be calculated analytically using:

$$C(k^*) = 1 + C_{QI}(k^*) + C_{FSI}(k^*) \quad (2)$$

C_{QI} describes plane-wave quantum interference:

$$C_{QI}(k^*) = \alpha \exp(-4k^{*2}R^2) \quad (3)$$

where $\alpha = (-1)^{2j}/(2j+1)$ for identical particles with spin j , and $\alpha = 0$ for non-identical particles. Obviously, $\alpha = 0$ for all analyses presented in this note. C_{FSI} describes the s-wave strong final state interaction between the particles:

$$C_{FSI}(k^*) = (1 + \alpha) \left[\frac{1}{2} \left| \frac{f(k^*)}{R} \right|^2 \left(1 - \frac{d_0}{2\sqrt{\pi}R} \right) + \frac{2\Re f(k^*)}{\sqrt{\pi}R} F_1(2k^*R) - \frac{\Im f(k^*)}{R} F_2(2k^*R) \right] \quad (4)$$

$$f(k^*) = \left(\frac{1}{f_0} + \frac{1}{2}d_0k^{*2} - ik^* \right)^{-1}; \quad F_1(z) = \int_0^z \frac{e^{t^2-z^2}}{z} dt; \quad F_2(z) = \frac{1-e^{-z^2}}{z}$$

where R is the source size, $f(k^*)$ is the s-wave scattering amplitude, f_0 is the complex scattering length, and d_0 is the effective range of the interaction.

An additional parameter λ is typically included in the femtoscopic fit function to account for the purity of the pair sample. In the case of no residual correlations (to be discussed in Section ??, the fit function becomes:

$$C(k^*) = 1 + \lambda [C_{QI}(k^*) + C_{FSI}(k^*)] \quad (5)$$