

# $J/\psi$ interactions in a hadron gas

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In heavy ion collisions after the quark-gluon plasma there is a hadronic gas phase. Using effective Lagrangians we study the interactions of charmed mesons which lead to  $J/\psi$  production and absorption in this gas. We update and extend previous calculations introducing strange meson interactions and also including the interactions mediated by the recently measured exotic charmonium resonances  $Z(3900)$  and  $Z(4025)$ . These resonances open new reaction channels for the  $J/\psi$ , which could potentially lead to changes in its multiplicity. We compute the  $J/\psi$  production cross section in processes such as  $D_{(s)}^{(*)} + \bar{D}^{(*)} \rightarrow J/\psi + (\pi, \rho, K, K^*)$  and also the  $J/\psi$  absorption cross section in the corresponding inverse processes. Using the obtained cross sections as input to solve the rate equation, we conclude that the interactions in the hadron gas slightly reduce the  $J/\Psi$  abundance.

## Summary

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