

# WPCF 2023 - XVI Workshop on Particle Correlations and Femtoscopy & IV Resonance Workshop 2023



Contribution ID: 55

Type: **Invited**

## Resonance production in the STAR experiment

*Wednesday, 8 November 2023 14:55 (25 minutes)*

Relativistic heavy ion collisions provide a unique opportunity for investigating nuclear matter's characteristics under extreme conditions of high temperature and density. Resonance particles, such as  $K^*$  and  $\phi$ , are considered good tools for probing the medium generated during these collisions. Specifically,  $K^*$ , with a relatively short lifetime of approximately 4 fm/c, undergoes decay within the fireball, allowing its decay products to interact with the surrounding medium. Consequently, the properties of the measured  $K^*$  can be altered by these in-medium interactions. In contrast, due to its significantly longer lifetime of approximately 42 fm/c, the  $\phi$  meson primarily decays outside the fireball, allowing its decay daughters only limited time for rescattering in the hadronic phase. Thus, comparing the behavior of  $K^*$  and  $\phi$  mesons in this context is of significant interest. Additionally, the  $\phi$  meson is regarded as a pristine probe of partonic collectivity, given its anticipated minimal hadronic interaction cross-section. In the forthcoming presentation, we will present the invariant yield of  $K^*$  and  $\phi$  as a function of beam energy (ranging from  $\sqrt{s_{NN}} = 7.7$  GeV to 200 GeV), as measured by the STAR experiment. We will also depict the ratios of resonance to non-resonance particles ( $\phi/K$  and  $K^*/K$ ) as a function of collision centrality at various beam energies. Furthermore, we will present the anisotropic flow ( $v_1$  and  $v_2$ ) of  $\phi$  mesons, across different beam energies.

**Primary author:** NASIM, Mohammad (Indian Institute of Science Education and Research, Berhampur (IISER Berhampur))

**Presenter:** NASIM, Mohammad (Indian Institute of Science Education and Research, Berhampur (IISER Berhampur))

**Session Classification:** Day 3 - Afternoon