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Centrality dependence of photon anisotropic flow at RHIC

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We calculate elliptic and triangular flow of thermal photons for different collision centralities at RHIC using event–by-event hydrodynamic model with fluctuating initial conditions. Photon v_3 as a function of p_T calculated with respect to the participant plane angle is found to be comparable to the elliptic flow parameter $v_2(p_T)$ for 0—20% centrality bin at RHIC. However, $v_2(p_T)$ rises much faster than $v_3(p_T)$ towards peripheral collisions and $v_3(p_T)$ is found to be largest for 20—40% centrality bin.

We study the event-by-event distributions of v_2 and v_3 and their corresponding initial state anisotropies to understand the correlation between them. A significant linear correlation between v_2 and ϵ_2 is observed at different p_T values, however we do not see any correlation between photon v_3 and the initial triangularity ϵ_3. This is unlike the case of hadrons where a clear mapping between hadronic v_3 and ϵ_3 has been observed. We conclude that indirect effects of initial state fluctuations, such as buildup of large transverse flow velocity contribute significantly to the observed v_3 results beyond leading to an overall triangular geometry.

On behalf of collaboration:

NONE

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