The 22nd International Conference on
Strangeness in Quark Matter
22-27 March, 2026, Los Angeles, CA

Contribution ID: **142** Type: **Oral Presentation**

Probing Charm Quark Hadronisation with Strange and Baryonic Probes

Wednesday, 25 March 2026 09:25 (20 minutes)

The hadronisation of charm quarks within the strangeness-rich environment of the Quark-Gluon Plasma (QGP) offers a unique laboratory for studying non-perturbative QCD dynamics. We present new measurements from the CMS experiment utilising the high-statistics lead-lead (PbPb) collision datasets from Run 2 and Run 3. This work features a high-precision measurement of the elliptic (v_2) and triangular (v_3) flow of prompt $D_s^{\pm}$ mesons, which provides a unique handle on charm quark dynamics, as it is directly sensitive to the interplay between charm quarks and the strange-enhanced QGP environment. Concurrently, we present the first-ever measurement of the elliptic flow (v_2) of the prompt $\Lambda_c^{\pm}$ baryon, providing a definitive test of charm quark thermalisation and the degree to which it participates in the medium's anisotropic expansion. By comparing the flow of $D_s^{\pm}$ and $\Lambda_c^{\pm}$ to non-strange D^0 mesons, we can disentangle the effects of quark mass, strangeness content, and baryon-versus-meson formation on charm quark thermalisation and hadronisation. These flow measurements are contextualized by recent results for the $\Lambda_c^{\pm}$ nuclear modification factor (R_{AA}) and the $\Lambda_c^{\pm}/D^0$ yield ratio, which provide crucial information on charm quark energy loss and hadronization mechanisms. Collectively, these results serve as a crucial benchmark for theoretical models, offering unprecedented insight into the fundamental mechanisms of heavy quark interactions and hadronisation in the QGP.

Authors: CMS COLLABORATION; SAHA, Nihar Ranjan (Purdue University)

Presenter: SAHA, Nihar Ranjan (Purdue University)

Session Classification: Parallel III: Resonances