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## Heavy Flavour Energy Loss in Small and Large Systems

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We present novel predictions for high- $p_T$  heavy flavour  $D$  and  $B$  meson suppression in  $p + p$ ,  $p + A$ ,  $d + A$  and  $A + A$  collisions at RHIC and the LHC. These predictions are made using a one-parameter convolved elastic and radiative energy loss model, which receives small system size corrections to both the elastic and radiative energy loss. We simultaneously predict the observed light flavour pion  $R_{AA}$  in both Au + Au and  $d + A$  collisions at RHIC, providing additional supporting evidence that QGP is formed in high-multiplicity  $d + A$  collisions at  $\sqrt{s} = 200$  AGeV. Our results are also consistent with the suppression of both light and heavy flavours in Pb + Pb collisions at the LHC. We are unable to reproduce the observed lack of suppression in high-multiplicity  $p + Pb$  collisions at the LHC. We propose that a system size scan will help separate radiative and elastic dominated suppression, as well as various theoretical uncertainties in HTL-based elastic energy loss. Predictions, along with a detailed theoretical uncertainty analysis, are presented for such a future system size scan including  $p + p$ ,  $p + A$ ,  $d + A$ ,  $^3\text{He} + A$ ,  $p + O$ ,  $O + O$ ,  $Xe + Xe$ , and  $Pb + Pb$  collision systems.

**Auteur principal:** FARADAY, Coleridge (University of Cape Town)

**Co-auteur:** Prof. HOROWITZ, W. A. (University of Cape Town)

**Orateur:** FARADAY, Coleridge (University of Cape Town)

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