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A model-independent parameterization of semileptonic B decays with two final-state hadrons

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Semileptonic B decays involving multiple final-state hadrons play a crucial role as backgrounds to studies of lepton flavour universality or recent anomaly observed in $B \to K\nu\nu$. Furthermore, these poorly understood decays constitute sizeable signal components in measurements of inclusive $B \to X_{u/c}\ell\nu$ decays and the subsequent extraction of inclusive V_{xb}.

Current theoretical models describing decays such as $B \to D\pi\ell\nu$ or $B \to \pi\pi\ell\nu$ rarely take contributions beyond dominant resonances into account, while neglecting non-resonant components.

In this talk, we present a novel, model-independent parameterization of three-hadron form factors.
The challenge is the dependence of the form-factors on two additional variables beyond the usual q^2-dependence: they can be chosen to correspond to the invariant mass and the helicity angle of the final state hadron system. Using dispersive methods we derive a systematic expansion in all three kinematic variables, generalizing the standard z-expansion, and bound the expansion coefficients through unitarity. Our method treats the two-hadron lineshapes in a model-independent manner using Omnès functions, thus allowing for a data-driven determination of all expansion parameters.

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