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Searching for the flavon at current and future colliders

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The B3–L2 Z' model may explain some gross features of the fermion mass spectrum as well as the $b \rightarrow sll$ anomalies. The Z' acquires its mass via a TeV-scale scalar field, the flavon (θ), whose VEV spontaneously breaks the family non-universal gauged U(1) symmetry. In this talk, I will discuss the phenomenology of the flavon field. After introducing the model, with an emphasis on its scalar potential, experimental data and perturbativity arguments are used to place bounds upon the parameter space of the model. I will then examine flavonstrahlung ($Z'^* \rightarrow Z' \theta$ production) at hadron and muon colliders as a means to directly produce and discover the flavon. We will see that a 100 TeV FCC-hh or a 10 TeV muon collider would have high sensitivity to flavonstrahlung, whereas the HL-LHC can observe it only in extreme corners of parameter space.

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