

A Search for Ultra-heavy Resonances Decaying to Vector-like Quark Pairs at the Run 2 CMS Experiment

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Diquarks are a class of ultra-heavy resonances that can theoretically be produced at the Large Hadron Collider with relatively large cross-sections and could provide explanations for a number of curious high-mass events reconstructed at the CMS Experiment during the Run 2 data-taking period. In theories where diquarks decay to pairs of vector-like quarks (VLQs), the resulting hadronic final state kinematics are highly complex, and new analysis techniques are needed to study these in a comprehensive way. Presented is a novel technique that uses event geometry and a series of Lorentz boosts to reach the approximate center-of-mass frames of the diquark and each VLQ in order to reconstruct their respective masses.

[in-person]

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