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Simplified dark matter model with novel Vector Boson Fusion signatures for searches at colliders

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We investigate the potential to search for dark matter within a simplified model that introduces a new scalar/vector resonance connecting the Standard Model (SM) to the dark sector composed by a Dirac fermionic dark matter particle. This mediator couples to SM vector bosons, including gluons, giving rise to novel Vector Boson Fusion (VBF) topologies. These allow for the exploration of such signatures at collider experiments. We analyze the constraints on the model's Wilson coefficients and other parameters from direct and indirect detection experiments, as well as from measurements of the dark matter relic abundance.

Author: RÍOS, Diego (UdeA)

Co-authors: RUÍZ, Jose David (UdeA); GARCÍA, David (UdeA); PARDO, Mario (UdeA)

Presenter: RÍOS, Diego (UdeA)

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