

Universal Extra Dimensions on (Projective) Sphere

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We propose a six dimensional Universal Extra Dimensions (UED) model compactified on a real projective plane RP^2 , a two-sphere with its antipodal points being identified. We utilize the Randjbar-Daemi-Salam-Strathdee spontaneous sphere compactification with a monopole configuration of an extra $U(1)_X$ gauge field that leads to a spontaneous radius stabilization. Unlike the sphere and the so-called S^2/Z_2 compactifications, the massless $U(1)_X$ gauge boson is safely projected out. We show how a compactification on a non-orientable manifold results in a chiral four dimensional gauge theory by utilizing 6D chiral gauge and Yukawa interactions. The resultant Kaluza-Klein mass spectra are distinct from the ordinary UED models compactified on torus. We briefly comment on the anomaly cancellation and also on a possible dark matter candidate in our model.

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