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Non-abelian Embeddings of the Standard Model Group and charge quantisation

Monday 2 June 2025 14:30 (30 minutes)

In this talk, I will show a novel minimal non-abelian gauge group to embed the $G_{\{SM\}}/Z1$ quotient with fractionally charged beyond the standard model matter fields and show how we can define a new quantum number n_6 that is written in terms of the generators of $G_{\{SM\}}$. We also comment on interesting aspects of this new number, like how the degree of compositeness can shift n_6. This new quantum number we suggest can give a full spectrum of allowed electric and magnetic charges and has an important connection to the topology of the standard model gauge group. I will also present results from ultra high energy cosmic ray simulations for magnetic monopoles of different magnetic charges as predicted by each quotient group of the SM.

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