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Towards a lattice determination of the form factors of the rare hyperon decay $\Sigma^+ \rightarrow p\ell^+\ell^-$

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The rare hyperon decay $\Sigma^+ \rightarrow p\ell^+\ell^-$ is an $s \rightarrow d$ flavour changing neutral current process that has been recently measured by the LHCb experiment with plans to improve this measurement in the future. This has prompted a need for an improved Standard Model prediction of the branching fraction of this decay.

We present our theoretical approach and progress towards an exploratory study of the form factors of this decay on an unphysical RBC-UKQCD lattice using $N_f = 2 + 1$ domain-wall fermions.

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