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Progress on the exploratory calculation 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, which is highly suppressed within the Standard Model, and is therefore sensitive to new physics. Due to recent improvements in experimental measurements of this decay, the Standard Model theory prediction must also be improved in order to identify any new physics in this channel. We present updates on our progress towards the first exploratory lattice calculation of the long-distance part of the form factors of this decay on a 340MeV pion mass ensemble using domain-wall fermions as part of the RBC-UKQCD collaboration.

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