Photon decay in UHE air showers: a stringent bound on Lorentz violation

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- With isotropic, nonbirefringent Lorentz violation (LV) in the photon sector the decay of UHE photons is possible, leading to **significant changes of the shower development.**
- Observations of the average depth of the shower maximum $\langle X_{\mathrm{max}} \rangle$ have been used to **place a stringent bound on LV.**
- The **inclusion of observations of the shower-to-shower fluctuations** $\sigma(X_{\mathrm{max}})$ can be used to place a **stricter bound** of $\kappa > -6 \times 10^{-21}$ ($98\,\%$ CL) improving the previous bound by a factor 50. This is the most stringent bound on this type of LV.

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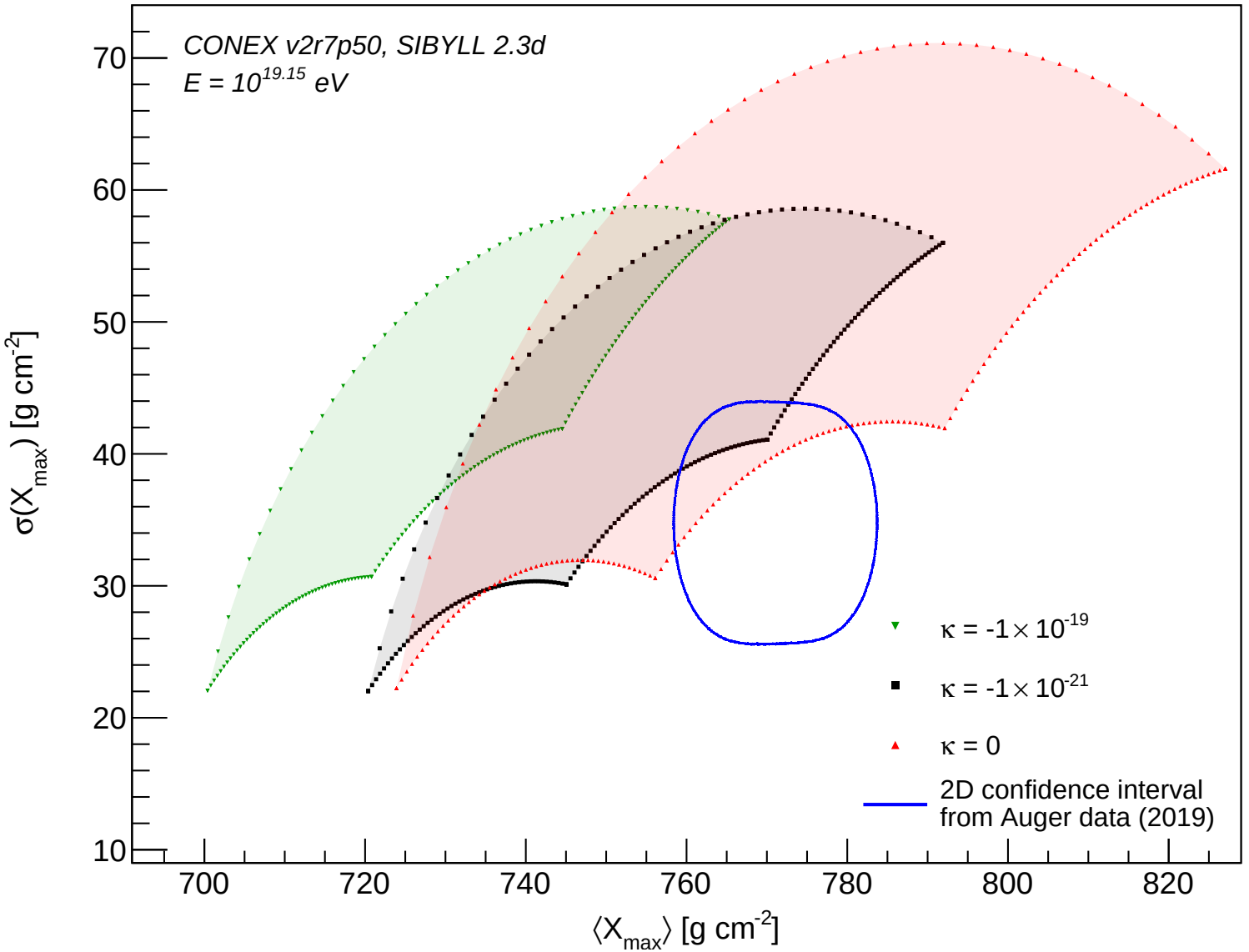

A stringent bound on Lorentz violation

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