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New physics potential of future tau neutrino telescopes

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The upcoming campaign of cosmogenic neutrino measurements provides us not only a way to understand the cosmic ray accelerators but also a promising portal to study fundamental particle physics. The future observation of cosmogenic neutrinos is guaranteed given the unprecedented sensitivity of many experimental programs. In this talk, I summarize the new physics potential of those facilities, with an emphasis on tau neutrino telescopes. I first discuss the minimal particle physics models which can modify the neutrino-matter interactions directly. Then I move on to a powerful event topology, the double and multiple bangs, and discuss its potential in particle physics studies, particularly for sphalerons. In the end, I mention other interesting new physics possibilities, to which the cosmogenic neutrino measurements can be sensitive.

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