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Particle detectors in (curved) space: the equivalence principle and QFT.

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Classically, the equivalence principle tells us that an observer cannot determine the global structure of spacetime using local measurements. After reviewing previous results demonstrating the sensitivity of detectors to spacetime, I proceed to our most recent result: that one can distinguish between a detector in flat space and one inside a hollow spherical shell by measuring the energy required to switch it on and off. These results suggest that, in principle, a particle detector can be used to probe the shape of spacetime far away from the detector itself due to the non-local nature of quantum fields.

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