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Casual Set Approach to a Minimal Invariant Length USHA RAUT — Any attempt to quantize gravity would necessarily introduce a minimal observable length scale of the order of the Planck length. This conclusion is based on several different studies and thought experiments and appears to be an inescapable feature of all quantum gravity theories, irrespective of the method used to quantize gravity. Over the last few years there has been growing concern that such a minimal length might lead to a contradiction with the basic postulates of special relativity, in particular the Lorentz-Fitzgerald contraction. A few years ago, Rovelli et.al, attempted to reconcile an invariant minimal length with Special Relativity, using the framework of loop quantum gravity. However, the inherently canonical formalism of the loop quantum approach is plagued by a variety of problems, many brought on by separation of space and time co-ordinates. In this paper we use a completely different approach. Using the framework of the causal set paradigm, along with a statistical measure of closeness between Lorentzian manifolds, we re-examine the issue of introducing a minimal observable length that is not at odds with Special Relativity postulates.

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