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Vacua and correlators on hyperbolic de Sitter sections

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Summary

I study the power- and bi-spectrum of vacuum fluctuations in a hyperbolic section of de Sitter space, comparing two states of physical interest: the Bunch-Davies and the hyperbolic vacuum. By introducing a one-parameter family of de Sitter hyperbolic sections and identifying a limit in which it reduces to the planar section, the family of hyperbolic states can be explicitly related to the standard Bunch-Davies state. Using this relation I then display the deviations from the standard inflationary predictions for the power- and bi-spectrum by considering the pure hyperbolic vacuum. In particular, for the bi-spectrum in the hyperbolic vacuum I will show that the corrections as compared to the standard Bunch-Davies result are not enhanced in specific momentum configurations and strongly suppressed for momenta large compared to the hyperbolic curvature scale. We close with some final remarks on physical states in de Sitter and its consequences for the stability of de Sitter space-time, which might have important implications for eternal inflation.

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