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**How General are Gravitational Wave Predictions from Preheating after Inflation?** JEFFREY HYDE, Arizona State Univ — A period of early universe inflation resolves several questions left unexplained in standard big bang cosmology, but its realization will require new ideas beyond the Standard Model of particle physics. In particular, an open question is the nature of the process known as reheating, by which the coherent state of the field responsible for inflation evolves into a thermal state of Standard Model particles. Since this involves interactions at very high energies, it is interesting to ask whether there are any observable effects that may survive until today, allowing us to study this energy scale - far above the what is accessible to colliders - empirically. Some work has predicted gravitational wave production during a brief preheating phase, that could in principle be observable. Ill describe my work showing that these predictions can depend enormously on interactions of the decay products that previous studies have largely ignored. This suggests that existing predictions may not be reliably extrapolated to realistic models. On the other hand, identifying the effect of various terms is a useful first step towards finding a way to extract insight into the underlying model, should this gravitational wave spectrum be measured.

Jeffrey Hyde
Arizona State Univ

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