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Cyclotomic spectra with Frobenius lifts and TR

Abstract: The cyclotomic trace is a map from algebraic K -theory to the more computationally accessible invariant given by topological cyclic homology, and in many cases this map is an equivalence after a suitable completion. The classical construction of topological cyclic homology relies on another invariant called TR which in turn is built from topological Hochschild homology using rather intricate methods from genuine equivariant homotopy theory. Recently, Nikolaus and Scholze gave a construction of topological cyclic homology completely bypassing the use of TR and genuine equivariant homotopy theory which simplified the theory to a great extent. Nonetheless, the importance of TR has persisted; for instance in the work of Antieau and Nikolaus on cyclotomic homotopy groups and in the work of Mathew on the Segal conjecture for topological Hochschild homology.

In this talk, I will present a construction of TR which does not rely on genuine equivariant homotopy theory similar in spirit to the construction of topological cyclic homology given by Nikolaus and Scholze. In fact, the construction exhibits TR as the co-free cyclotomic spectrum with Frobenius lifts extending work of Krause and Nikolaus in the p -typical case. As an application, we give a formula for TR in terms of Bloch's spectrum of curves on K -theory generalizing work of Hesselholt, Betley, and Schlichtkrull.