1127-55-20   **Yifei Zhu*** (`zyf@umn.edu`). *Toward calculating unstable higher-periodic homotopy types.*

The rational homotopy theory of Quillen and Sullivan identifies homotopy types of topological spaces with differential graded commutative (co)algebras, and with differential graded Lie algebras, after inverting primes. Given any non-negative integer n, we can instead invert certain v_n-*self maps* and seek algebraic models for the resulting unstable v_n-*periodic* homotopy types. I'll explain why this is a natural and useful generalization of the classical story, and how a version of it has been achieved through Goodwillie calculus in recent work of Behrens and Rezk. I'll then explain my work on its applications to calculating unstable homotopy types in the case of $n = 2$. A key tool is power operations in Morava E-theory. (Received December 22, 2016)