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Zhouli Xu* (xuzhouli@ucsd.edu). *The Adams differentials on the classes h_j^3 .*

A systematic understanding of differentials in the Adams spectral sequence is a fundamental problem in stable homotopy theory.

In Adams filtration 1, by using the theory of secondary cohomology operations, Adams computed the differentials on the classes h_j and solved the famous Hopf invariant problem. In Adams filtration 2, by using equivariant stable homotopy theory and chromatic homotopy theory, Hill–Hopkins–Ravenel solved the celebrated Kervaire invariant problem, with the only exception of h_6^2 . The precise answers for nonzero differentials on the classes h_j^2 for $j \geq 6$ remains unknown.

In this talk, in Adams filtration 3, I will discuss computation of differentials on the classes h_j^3 for all j . This computation uses motivic stable homotopy theory in an essential way.

I will also discuss some questions and conjectures for future study.

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