1052-55-160 **Scott M. Bailey*** (bailey@math.rochester.edu), Department of Mathematics, University of Rochester, RC Box 270138, Rochester, NY 14627. *On the Tate spectrum of* tmf *at the prime 2.*

The root invariant of Mahowald associates to every element $\alpha$ in the stable homotopy groups of spheres, another element $R(\alpha)$. Since its construction introduces indeterminacy, the root invariant is a coset in general. Ravenel and Mahowald conjectured that the root invariant of a $v_n$-periodic element is $v_{n+1}$-periodic. Furthermore, they continued to exhibit a relationship between elements that were themselves root invariants with their behavior in the EHP spectral sequence. In particular, $R(-)$ seems to provide an interesting connection between the unstable world and the chromatic view of the stable world. Although neither a proof, nor a precise statement, of this phenomenon exists there are computations establishing its plausibility. For example, the root invariant is closely related to that of the Tate spectrum, $tE$, of a spectrum $E$. Numerous authors have given examples of $v_n$-periodic cohomology theories ($b$o, $BP\langle 2\rangle$, Johnson-Wilson theories $E(n)$, etc.) which split into $v_n$-torsion after the Tate spectrum functor is applied. In this talk, I will define the Tate spectrum functor, and discuss a similar phenomenon of $t(\mathrm{tmf})$ at the prime $p = 2$. (Received August 26, 2009)