1043-55-49 **Scott M Bailey***, University of Rochester, Department of Mathematics, R.C. Box 270138, Rochester, NY 14627-0138. *On the Tate spectrum of tmf at the prime 2.* Preliminary report.

The root invariant of Mahowald associates to every element α in the stable homotopy groups of spheres, another element $R(\alpha)$. Since the 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 chromatic view of the stable world. Although neither a proof, nor a precise statement, of this phenomena exists there are computations establishing its plausibility. For example, the construction of 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 (bo, $BP\langle 2\rangle$, Johnson-Wilson theories $E(n)$, etc.) which become v_n-torsion under the Tate spectrum construction. In this talk, I will define the Tate spectrum functor, and discuss a similar splitting of $t(tmf)$ at the prime 2. (Received August 11, 2008)