1120-13-38 **Lars Winther Christensen*** (lars.w.christensen@ttu.edu) and **Srikanth B Iyengar**. *Tests for injectivity of modules over commutative rings.* Preliminary report.

Let R be a commutative ring. In cohomological terms, Baer's criterion says that an R-module M is injective if $\operatorname{Ext}^1_R(R/\mathfrak{a}, M) = 0$ holds for every ideal $\mathfrak{a}$ in R. When R is also noetherian, it suffices to test against prime ideals and locally. Indeed, M is injective if either of the following conditions holds:

- $\operatorname{Ext}^1_R(R/\mathfrak{p}, M) = 0$ for every prime ideal $\mathfrak{p}$ in R;
- $\operatorname{Ext}^1_{R_\mathfrak{p}}(k(\mathfrak{p}), M_\mathfrak{p}) = 0$ for every prime ideal $\mathfrak{p}$ in R.

Here $k(\mathfrak{p})$ denotes the field $(R/\mathfrak{p})_\mathfrak{p}$. The theorem I will discuss says that injectivity can be detected by vanishing of Ext globally against these fields. It leads to the following characterization of injective modules: If F is faithfully flat, then a module M such that $\operatorname{Hom}_R(F, M)$ is injective and $\operatorname{Ext}^i_R(F, M) = 0$ for all $i \geq 1$ is injective. (Received January 29, 2016)