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Ben J. Anderson* (benjamin.j.anderson@ndsu.edu), NDSU Mathematics Dept #2750, PO Box 6050, Fargo, ND 58108, and **Jim Coykendall** and **Sean Sather-Wagstaff**. *Nakayama's Lemma for Ext and ascent for module structures*. Preliminary report.

Let $\varphi: (R, \mathfrak{m}, k) \rightarrow (S, \mathfrak{m}S, k)$ be a flat local ring homomorphism, and let M be a finitely generated R -module. We show that the following are equivalent:

1. M has an S -module structure compatible with its R -module structure;
2. $\text{Ext}_R^i(S, M) = 0$ for $i \geq 1$;
3. $\text{Ext}_R^i(S, M)$ is finitely generated over R for $i = 1, \dots, \dim_R(M)$;
4. $\text{Ext}_R^i(S, M)$ is finitely generated over S for $i = 1, \dots, \dim_R(M)$;
5. $\text{Ext}_R^i(S, M)$ satisfies Nakayama's Lemma over R for $i = 1, \dots, \dim_R(M)$.

This improves upon recent results of Frankild, Sather-Wagstaff, and Wiegand and results of Christensen and Sather-Wagstaff. (Received January 24, 2011)