1056-13-1439   **Phillip A. Griffith**, Urbana, IL 61801, and **Alexandra Seceleanu*** (`asecele2@illinois.edu`).
Syzygy Theorem via Comparison of Order Ideals.

The Evans-Griffith Syzygy Theorem states that the rank of a non-free kth syzygy of a module over a Noetherian local ring is at least k. In the original proof, the height of order ideals of minimal generators for syzygy modules plays a prominent role.

We introduce a comparison theorem for heights of order ideals of consecutive syzygies modulo a hyperplane section. We use this theorem and the Syzygy Theorem in equicharacteristic p to prove some relevant cases of the Syzygy Theorem in mixed characteristic. In particular we prove the Syzygy Theorem in unramified mixed characteristic for syzygies of prime ideals. (Received September 22, 2009)

1