Frobenius Depth and its Applications

Majid Eghbali

To consider vanishing of local cohomology modules and in the case $R$ is a local ring containing a field of positive characteristic, Lyubeznik introduced the notion of F-depth $R$ in terms of the Frobenius action on the finitely many local cohomology modules $H^i_{m}(R)$. More precisely, F-depth $R$ is the smallest $i$ such that $f^s : H^i_{m}(R) \to H^i_{m}(R)$ does not send $H^i_{m}(R)$ to zero for any integer $s > 1$. In this talk, after some preliminary result, we compare it with the notion of F-depth defined by Hartshorne and Speiser, quickly. Then, we examined more properties of F-depth. Finally, we compare the F-depth $R$ with some other invariants of local rings for explicit computations.