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**Luis Núñez-Betancourt** (luisnub@umich.edu) and **Emily E. Witt\*** (ewitt@umn.edu). *A generalization of Lyubeznik numbers*. Preliminary report.

Thanks to his proof, using  $D$ -module theory, that when  $R$  is an equicharacteristic regular local ring, the Bass numbers of all  $H_I^i(R)$  are finite, Lyubeznik introduced a family of invariants now called *Lyubeznik numbers*. We give a generalization of Lyubeznik numbers using the fact that some local cohomology modules have finite length as  $D$ -modules (for certain rings of differential operators  $D$ ). We also define Lyubeznik numbers for local rings of mixed characteristic. (Received August 30, 2011)