

1106-VJ-1109 **Jessica L Williams*** (jessica-l-williams@uiowa.edu), 14 MacLean Hall, University of Iowa, Iowa City, IA 52242. *Radicals of Extensions*. Preliminary report.

This is a report on a Ph.D. thesis project with an emphasis on advanced undergraduate accessibility. Let A and B be Abelian groups and X be an extension of B by A . What is the Jacobson radical of X ? Suppose A is an infinite direct sum of simple Abelian groups and B is the rational numbers. A subtle, surprising, homological proof shows that the corresponding extension has non-zero Jacobson radical if and only if the extension splits. We are also able find a direct, computational proof. This motivates consideration of a general case: R is a commutative ring, A is a suitably conditioned torsion R -module and B is an R -module with some divisibility properties. Examples and results are discussed, including problems that arise by translating this project into the language of presentations and infinite matrices. (Received September 11, 2014)