1057-13-245   **Henrik Holm*** (`hholm@life.ku.dk`), Department of Basic Sciences and Environment, Thorvaldsensvej 40, DK-1871 Frederiksberg C, Copenhagen, Denmark. *Rings without a Gorenstein analogue of the Govorov-Lazard theorem.*

This talk is a report on joint work with Peter Jørgensen.

It was proved by Beligiannis and Krause that over certain Artin algebras, there are Gorenstein flat modules which are not direct limits of finitely generated Gorenstein projective modules. That is, these algebras have no Gorenstein analogue of the classical Govorov-Lazard Theorem.

We show that, in fact, there is a large class of rings without such an analogue. Namely, let R be a commutative local noetherian ring. Then the analogue fails for R if it has a dualizing complex, is henselian, not Gorenstein, and has a finitely generated Gorenstein projective module which is not free.

The proof is based on a theory of Gorenstein projective (pre)envelopes. We show, among other things, that the finitely generated Gorenstein projective modules form an enveloping class in the category of finitely generated R-modules if and only if R is Gorenstein or has the property that each finitely generated Gorenstein projective module is free.

This is analogous to a recent result on covers by Christensen, Piepmeyer, Striuli, and Takahashi, and their methods are an important input to our work. (Received January 24, 2010)