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Valentina Harizanov* (harizanv@gwu.edu), Department of Mathematics, George Washington University, Washington, DC 20052. *Coding structures into structures*. Preliminary report.

Computable model theory studies algorithmic phenomena on countable structures. Often, interesting such phenomena are first obtained on structures of special kind. We will discuss general techniques of coding certain structures into other types of algebraic structures in such a way that relevant computability theoretic properties are transferred. Some of these codings, first used by Rabin and Scott, and Mal'cev, were also used several years ago in modern computable model theory by Hirschfeldt, Khoushainov, Shore, and Slinko. We will present our new results about 2-step nilpotent groups, obtained jointly with W. Calvert, J. Knight, and A. Morozov, which exploit Mal'cev's coding of fields into groups. In particular, we are interested in the Scott rank of these groups. (Received September 06, 2006)