Meeting: 1057, Lexington, Kentucky, SS 23A, Special Session on Interactions between Logic, Topology, and Complex Analysis

Stephen G Simpson* (simpson@math.psu.edu), Department of Mathematics, McAllister Building, Pollock Road, Pennsylvania State University, State College, PA 16802. *The Reverse Mathematics of General Topology.*

In reverse mathematics, specific mathematical theorems are classified up to logical equivalence over a weak base theory, according to the strength of the set-existence axioms which are needed to prove them. An empirical phenomenon confirmed by many case studies is that many theorems fall into one of the "big five" equivalence classes: RCA_0, WKL_0, ACA_0, ATR_0, Π^1_1-CA_0. However, Mummert and Simpson have found that a certain metrization theorem in general topology falls into an equivalence class Π^1_2-CA_0 which is much, much stronger than any of the big five. For any countable partially ordered set P, let MF(P) be the space of maximal filters on P. This class of spaces is known to include all complete separable metric spaces as well as many nonmetrizable spaces. The metrization theorem in question states that MF(P) is completely metrizable if and only if it is regular. (Received January 25, 2010)