RAMSEY'S THEOREM ON TREES AND WEAK KÖNIG LEMMA

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Abstract. Ramsey's Theorem for Pairs has been studied intensively in reverse mathematics. One of the major breakthroughs is Liu Lu's 2012 result showing RT^2_2 does not imply WKL_0. Liu's result not only answered an important question in reverse mathematics, the technique that he used turns out to have wider applications, for example, in Monin and Patey's separation of SRT^2_2 and RT^2_2.

In this talk, we generalize Liu's result to tree. Let TT^2_k denote the combinatorial principle stating that every k-coloring of pairs of compatible nodes on the full binary tree has a homogeneous solution, i.e. an infinite perfect tree in which all pairs of compatible nodes have the same color. We show that over the base system RCA_0, TT^2_k doe not imply weak König's lemma. This is joint work with Chitat Chong, Li Wei and Liu Lu.

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