A DESCRIPTIVE MAIN GAP THEOREM

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Abstract. Answering a question of S. Friedman, Hyttinen and Kulikov, we show that there is a tight connection between the depth of a classifiable shallow theory T and the Borel rank of the isomorphism relation $\cong_T^\kappa$ on its models of size κ, for κ any cardinal satisfying $\kappa^{<\kappa} = \kappa > 2^{\aleph_0}$. This yields a descriptive set-theoretical analogue of Shelah's Main Gap Theorem. We also discuss some limitations to the possible (Borel) complexities of $\cong_T^\kappa$, and provide a characterization of categoricity of T in terms of the descriptive set-theoretical complexity of $\cong_T^\kappa$. Joint work with F. Mangraviti.