▸ GIOVANNI SOLDÀ, *On the strength of some first-order problems corresponding to Ramseyan principles.*

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Given a represented space X, we say that a problem f with $\mathrm{dom}(f) \subseteq X$ is *first-order* if its codomain is $\mathbb{N}$. In this talk, we will study, from the point of view of Weihrauch reducibility, some first-order problems corresponding to Ramseyan combinatorial principles.

We will start by analyzing some problems that can be seen naturally as first-order: more specifically, after mentioning some well-established results due to Brattka and Rakotoniaina [1], we will proceed to study some principles whose strengths, form a reverse mathematical perspective, lie around $\mathsf{I}\Sigma^0_2$, as proved mainly in [2].

We will then move to study the *first-order part* ${}^1f$ of problems f which cannot be presented as first-order ones: intuitively speaking, ${}^1f$ corresponds the strongest first-order problem Weihrauch reducible to f. The first-order part operator was introduced by Dzhafarov, Solomon and Yokoyama in unpublished work, and it has already proved to be a valuable tool to gauge the strengths of various problems according to Weihrauch reducibility. After giving some technical results on this operator, we will focus on ${}^1(\mathsf{RT}^2_2)$, presenting various results on the position of its degree in the Weihrauch lattice.

The results presented are joint work with Arno Pauly, Pierre Pradic, and Manlio Valenti.

[1] Vasco Brattka and Tahina Rakotoniaina, *On the uniform computational content of Ramsey's theorem*, ***The Journal of Symbolic Logic***, vol. 82 (2015), no. 4, pp. 1278–1316

[2] Leszek A. Kolodziejczyk, Henryk Michalewski, Pierre Pradic, and Michał Skrzypczak, *The logical strength of Büchi's decidability theorem*, ***25th EACSL Annual Conference on Computer Science Logic (CSL 2016)*** (Marseille, France), (Jean-Marc Talbot and Laurent Regnier), vol. 62, Schloss Dagstuhl–Leibniz-Zentrum für Informatik, 2016, pp. 36:1–36:16.