

PROBABILISTIC ARGUMENTS IN REVERSE MATHEMATICS

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ABSTRACT

In recent development of the reverse mathematics of Ramsey theory, there are some successful applications of probabilistic arguments. By blending probabilistic arguments and an idea of Seetapun, we have enriched the complicated map of the Reverse Mathematics Zoo. In this talk, I will start from a theorem of Csimá and Mileti [1] about Rainbow Ramsey Theorem for pairs. Then I will add the idea of Seetapun and sketch a proof of that Rainbow Ramsey Theorem for triples is strictly weaker than Ramsey's Theorem for triples [2]. Finally, I will move further to sketch a proof of $\text{RCA}_0 + \text{RRT}_2^3 \not\vdash \text{RRT}_2^4$ [3].

REFERENCES

- [1] Barbara Csimá and Joseph Mileti. The strength of the rainbow Ramsey theorem. *Journal of Symbolic Logic*, 74(4):1310–1324, 2009.
- [2] Wei Wang. Rainbow Ramsey Theorem for triples is strictly weaker than the Arithmetic Comprehension Axiom. *Journal of Symbolic Logic*, 78(3):824–836, 2013.
- [3] Wei Wang. Cohesive sets and rainbows. *Annals of Pure and Applied Logic*, 165(2):389–408, 2014.