

- EMIL JEŘÁBEK, *Arithmetical and propositional reflection principles*.  
Institute of Mathematics of the Czech Academy of Sciences, Žitná 25, 115 67 Praha 1,  
Czech Republic.  
*E-mail:* [jerabek@math.cas.cz](mailto:jerabek@math.cas.cz).  
*URL Address:* <http://math.cas.cz/~jerabek>.

Reflection principles are established as an important tool in the study of first-order theories of arithmetic. In the realm of strong fragments of arithmetic (say, above  $I\Delta_0 + EXP$ ), this means *first-order reflection principles* expressing the soundness of subsystems of arithmetic itself with respect to formulas of bounded complexity. First-order reflection schemata come in various shapes depending on their purpose (uniform reflection principles, local reflection principles, reflection rules), and since they operate inside with the same language as outside, they can be iterated.

This approach is of no use for weak theories of arithmetic such as fragments of bounded arithmetic  $I\Delta_0 + \Omega_1$ , since these theories cannot even prove the consistency of the base theory  $Q$ . However, fragments of bounded arithmetic can be analyzed using reflection principles for *propositional proof systems*, expressing that tautologies of bounded complexity provable in the system are true under Boolean assignments. Using translation of bounded formulas into propositional language, these reflection principles can be themselves expressed by sequences of propositional tautologies.

In this talk, I will review basic properties of reflection principles in both setups, highlighting what makes them similar and what makes them different.