

**ARITHMETIC BASED ON LOGIC WITHOUT
CONTRACTION AND GÖDEL'S SECOND
INCOMPLETENESS THEOREM**

Lev Beklemishev
Steklov Institute

We examine the validity of Gödel's second incompleteness theorem (G2) for systems of arithmetic based on logic weaker than the classical one. In the first part of the talk we formulate a very general framework and suitable generalizations of Bernays-Löb derivability conditions. They suffice in the contexts where the logic is very weak, e.g. it may lack the connectives of implication and negation. The role of the structural rule of contraction for G2 is emphasised. In the second part of the talk we consider a test case of arithmetic based on a logic without contraction rule (affine arithmetic) and show that it does satisfy G2. (Joint work with D. Shamkanov.)