1154-08-931   **Dmitriy Zhuk*** (`zhuk@intsys.msu.ru`), Saratovskaya 22, 503, Moscow, 109125, Russia. *Four types of subuniverses and the complexity of the constraint satisfaction problem.* Preliminary report.

The Constraint Satisfaction Problem (CSP) is the problem of deciding whether there is an assignment to a set of variables subject to some specified constraints. In general, this problem is NP-complete but if we restrict the constraint language it can be solved in polynomial time. In 2007 it was conjectured that CSP over a constraint language Γ is tractable if and only if Γ is preserved by a weak near-unanimity operation. After many efforts and partial results, this conjecture was independently proved by Andrei Bulatov and the author in 2017.

In my talk we will discuss the main ingredient of my proof, that is, four types of subuniverses and their algebraic properties. We will consider finite idempotent algebras $(A; w)$, where w is a WNU operation, and will show that on every algebra of size greater than 1 there exists a nontrivial subuniverse C (not empty, not full) of one of four types: binary absorbing, central, PC, and linear. Moreover, these subuniverse have a lot of nice properties such as: two nonempty subuniverses of different types cannot have an empty intersection. We will discuss these properties as well as their implications for the complexity of the constraint satisfaction problem. (Received September 12, 2019)