Item response theory models are an elegant way of explaining test behavior by segregation of item properties from the properties of test takers. IRT-based inferences about latent traits (e.g. abilities, attitudes). IRT analyses of data became a common approach in psychological, educational and sociological research. However, the validity of such inferences is critically related to the extent to which IRT models fit the data. This fact has been reflected in the Standards for educational and psychological testing (AERA, APA & NCME 2014), where it is recommended that giving sufficient evidence of model fit should be a prerequisite of making any inferences based on IRT. A number of authors pointed to consequences of lack of fit of IRT model for subsequent analyses (Wainer & Thissen, 1987, Woods, 2008, Bolt, Deng & Lee, 2014). Despite an ample research there is no consensus among scholars regarding what would be the best practice.

The project proposes a novel method of examination of item fit. It postulates dividing the distribution of latent variable into equal (with regard to the mass of distribution) intervals, by employing a method of plausible values (PVs). Due to the use of PVs the unreliability of measurement of latent variable is taken into account. Item response of a single person is included simultaneously into many groups with probability weight proportional to the density of a posteriori latent trait distribution of that person in each group.

Development of a novel method of item fit analysis for unidimensional IRT models will be a direct result of the project, and as such would contribute to the field of psychometrics. If proven to be effective, the method could be also expanded to incorporate other types of items, than just the dichotomous ones. Additionally, a novel tool of item fit analysis, creates ground for improvement of inferences based on IRT modelling, which is used commonly in nowadays social science research.