To estimate an integer parameter vector in a linear model, a typical method is to
solve an integer least squares (ILS) problem. The most widely used approach to
solving an ILS problem is the so called sphere decoding methods. It has been
observed that using the well-known LLL reduction as preprocessing can make a sphere
decorder faster and can improve the success probability of the Babai point, a
suboptimal solution. In this talk we rigorously show that both observations are
true in theory.

This is a joint work with Xiao-Wen Chang and Xiaohu Xie.