

Prof. Mag. Dr. Hannes Leeb  
University of Vienna

TITLE:

**On conditional moments of high-dimensional random vectors  
given lower-dimensional projections**

ABSTRACT:

One of the most widely used properties of the multivariate Gaussian distribution, besides its tail behavior, is the fact that conditional means are linear and that conditional variances are constant. We here show that this property is also shared, in an approximate sense, by a large class of non-Gaussian distributions. We allow for several conditioning variables and we provide explicit non-asymptotic results, whereby we extend earlier findings of Hall and Li (1993) and Leeb (2013).

These results have immediate consequences for modern statistical technology, in particular for inference with sparse working models when the true model need not be sparse.

(This is joint work with Lukas Steinberger.)