1072-22-136 **Siddhartha Sahi*** (sahi@math.rutgers.edu), Department of Mathematics Rutgers University, Hill Center - Busch Campus, 110 Frelinghuysen Road, Piscataway, NJ 08854-8019, and **Dmitry Gourevitch** (dimagur@weizmann.ac.il), Faculty of Mathematics and Computer Science, The Weizmann Institute of Science, POB 26, 76100 Rehovot, Israel. *Associated varieties, derivatives, Whittaker functionals, and rank for unitary representations of GL(n,R).*

To each irreducible unitary representation π of $GL(n,\mathbb{R})$ one may associate a partition λ of n, which can be computed explicitly from the Vogan classification, and more generally from the annihilator variety of π.

Our first result shows λ determines (and is determined by) the existence of certain degenerate Whittaker functionals, for both smooth and K-finite vectors. This generalizes results of Casselman-Zuckerman, Kostant, Matumoto and others.

The second result relates λ to the sequence of Bernstein-Zelevinsky type highest derivatives, as defined in this setting by the speaker. This enables us to compute these highest derivative for almost all basic unitary representations of $GL(n,\mathbb{R})$, providing a partial answer to a question raised by the speaker in joint work with Stein.

The third result relates λ to Howe's notion of rank, as extended to $GL(n,\mathbb{R})$ by Scaramuzzi. This allows us to define a more refined notion of rank and answer an old question of Howe. (Received June 25, 2011)