AUTOMORPHIC KERNEL FUNCTIONS WORKSHOP

These problems were stated in the problem brainstorming session:

Basic Functions:

(1) What does one need to know about "basic functions" to put them in the trace formula? What are asymptotics of the "basic functions"?
(2) Define and explain the Fourier transform for Vinberg monoids. Find their relations to the Langlands-Shahidi method and the Rankin-Selberg method.

Endoscopy and Beyond:

(1) Can beyond endoscopy be used to prove that the $R(\theta)$-bounds in the work of Jiang-Liu are sharp?
(2) Relative endoscopy: Develop the theory of relative endoscopy in conjunction with the relative trace formula.
(3) Referring to MR3117742: there are transfer factors from an elliptic torus in GL_2 to GL_2. What about transfer factors from GL_2 to an elliptic torus?
(4) What are the relations between the intertwining operators and character relations? See Labesse-Langlands.

Beyond Endoscopy:

(1) Isolate contributions of the continuous "special" representations on the geometric side of the trace formula. Here, *special* refers to larger poles of relative L-functions. Some special cases may be related to the Rankin-Selberg integral method, for instance, the doubling integral method of Piatetski-Shapiro and Rallis on GL_n or GL_2.
(2) Take the current literature on beyond endoscopy, and make a list of the precise local and global statements required. For example: local matching and global matching.
(3) Arthur has introduced the so-called r-trace formula. Describe (and name!) the r-"beyond endoscopy" groups and discuss the meaning of geometric matching.
(4) How does the functional equation give an expression for the r-trace formula? In other words, how does the r-Fourier transform play roles here?
(5) Isolate the contribution of hyperkloosterman sums to the Kuznetsov trace formula and explain it spectrally.

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