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THE SELBERG TRACE FORMULA II: PARTITION, REDUCTION, TRUNCATION

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Let G be a reductive Lie group; let Γ be a non-uniform lattice in G. Here we shall lay the analytic and geometric foundations on which the derivation of the Selberg trace formula for the pair (G, Γ) will eventually be based.

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1. Introduction. This is the second in a projected series of papers in which we plan to come to grips with the Selberg trace formula, the ultimate objective being a reasonably explicit expression. We shall take as the basic reference and point of departure our memoir [**3.a**] to which we refer the reader for a complete discussion of the foundations of the theory, as well as additional background material. It will be recalled that the first paper in this series (cf. [**3.b**]) was devoted to a discussion of these questions in the special case when the rank of the ambient lattice was unity. Philosophically heuristic, the essential plan of attack, incorporating most of the basic ideas, can be found there already. We would not be stretching matters much by saying that our chief concern in this paper and its successors is to take a given point from the rank-one picture and push it through in general, leading eventually to a grand compilation.

The theory centers on a reductive Lie group G and a non-uniform lattice Γ in G, both satisfying the usual conditions, the ultimate object of study being $L^2(G/\Gamma)$. Since we have amply dealt with what one knows (and what one wants to know) about $L^2(G/\Gamma)$ elsewhere, there is nothing to be gained by repeating this theme here. Instead, we shall content ourselves with a brief indication of the highlights of the present paper.