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What the proof of the Fundamental Lemma gives us

The recent proof of the Fundamental Lemma by Ngo Bau Chau is a breakthrough in the theory of automorphic forms and the Langlands programme. It is the culmination of work carried out by a number of mathematicians over the past thirty years. We shall try to motivate the origins of the problem in the trace formula, and to say something of the history of its proof. We shall then describe how its resolution opens the way for progress on the representations of classical groups, the theory of Shimura varieties, and the principle of functoriality.