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Basic Harish-Chandra series, quantum monodromy and applications.

The basic Harish-Chandra series associated to root systems form a basis of common eigenfunctions of the Macdonald-Ruijsenaars difference operators. They depend on a choice of a fundamental Weyl chamber. Connection coefficients are the expansion coefficients relating Harish-Chandra series of different fundamental Weyl chambers. Determining explicit expressions of these connection coefficients as quotients of theta functions is the associated quantum monodromy problem. In this talk I discuss its solution. I will discuss applications of this result for

- * Elliptic integrable systems.
- * Baker-Akhiezer functions (monodromy free solutions).
- * Basic hypergeometric functions associated to root systems (quantum spherical functions).