

**ASYMPTOTICS OF CLUSTER OF EIGENVALUES FOR
PERTURBATIONS OF THE HYDROGEN ATOM
HAMILTONIAN**

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We present in this talk a limiting eigenvalue distribution theorem for the Schrödinger operator of the hydrogen atom (with the Planck parameter \hbar included) plus ϵ times a bounded continuous function Q . By considering suitable dilation operators, we prove that taking $\epsilon = O(\hbar^2)$ we obtain well defined clusters of eigenvalues around the energy $E = -1/2$ whose limiting distribution involves the Radon transform of the function Q along the classical orbits of the Kepler problem with energy $E = -1/2$ with respect to an integration over the space of geodesics of the 3-sphere S^3 . The idea of the proof involves a well known unitary transformation from the Hilbert space generated by the bound states of the hydrogen atom onto $L^2(S^3)$ and coherent states on the sphere S^3 . We will comment on the generalization of the theorem above to the n -dimensional case and when Q is a pseudodifferential operator of order zero.