Closed geodesics and Frøyshov invariants of hyperbolic three-manifolds

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Frøyshov invariants are subtle numerical topological invariants of rational homology three-spheres derived from gradings in monopole Floer homology. In this talk I will look at their relation with invariants arising from hyperbolic geometry (such as volumes and lengths of closed geodesics), using an odd version of the Selberg trace formula and ideas from analytic number theory. In particular, for the class of minimal L-spaces, I will discuss how to obtain effective upper bounds purely in terms of volume and injectivity radius. Furthermore, I will describe (again for minimal L-spaces) a procedure to compute them taking as input explicit geometric data, and show for example how this can be used to determine all the Frøyshov invariants for the Seifert-Weber dodecahedral space. This is joint work with M. Lipnowski.