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Framed instanton homology and Dehn surgery. Preliminary report.

In recent work we showed that the framed instanton homologies of all Dehn surgeries on a given knot K in S^3 are determined by a single pair of integers, denoted $\nu^\sharp(K)$ and $r_0(K)$. In this talk we discuss how a new symmetry property of cobordism maps in framed instanton homology, similar to the conjugation symmetry in Heegaard Floer homology, allows us to show that $\nu^\sharp(K)$ is always zero or odd. We apply this to the Dehn surgery realization problem for rational homology spheres, especially those which are almost L-spaces. (Received January 04, 2021)