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Perverse obstructions to regular flat compactifications

Suppose S is a smooth, complex variety containing a dense Zariski open subset U, and suppose W is a smooth projective family of varieties over U. It seems natural to ask when W admits a regular flat compactification over S. In other words, when does there exist a smooth variety X flat and proper over S containing W as a Zariski open subset? Using resolution of singularities, it is not hard to see that it is always possible to find a regular flat compactification when S is a curve. My main goal is to point out that, when dim S¿ 1, there are obstructions coming from local intersection cohomology. My main motivation is a recent paper of Laza, Sacca and Voisin (LSV) who construct a regular flat compactification in the case that W is a certain family of abelian 5-folds over an open subset of 5 dimensional projective space. On the one hand, I'll explain how to compute the intersection cohomology in certain related examples and show that these are obstructed. On the other hand, I'll use the vanishing of the intersection cohomology obstructions implied by the LSV theorem to deduce a theorem on the palindromicity (=numerical Poincare duality) of the cohomology groups of certain singular cubic 3-folds.