Abstract: Let $M^3 = H \cup_F \mathcal{H}$ be a Heegaard diagram of an oriented 3-dimensional homology 3-sphere $M^3$, where $H$’s are handlebodies (of genus $g$) and $F = \partial H$ is the common boundary surface. The meridians of both sides become the $\alpha$-curves ($\alpha_1, \alpha_2, \ldots, \alpha_g$) and the $\beta$-curves ($\beta_1, \beta_2, \ldots, \beta_g$) on $F$. Assume that they intersect transversely. Fix a complex structure of $F$ and it induces a symplectic structure on the $g$-fold symmetric product $\text{Sym}^g(F)$. The tori $T_\alpha = \alpha_1 \times \alpha_2 \times \cdots \times \alpha_g$ and $T_\beta = \beta_1 \times \beta_2 \times \cdots \times \beta_g$ are Lagrangians of $\text{Sym}^g(T)$. Peter Ozsváth and Zoltán Szabó have considered the Lagrangian intersection homology theory à la Floer. It turns out that the chain complexes may depend on various choices but the homology groups are the same up to isomorphisms. These are the O-Z invariants of $M^3$. For the standard $S^3$, it is isomorphic to $\mathbb{Z}$. (We say that O-Z = 1.)

In a very preliminary joint work with T.J. Li, we try to describe O-Z directly from the $\alpha$-curves and $\beta$-curves on $F$. Particularly, we are experimenting the following question:

**Question:** How do we describe the $\alpha$-curves and $\beta$-curves when O-Z = 1 (and $g = 2$)?

We also speculate the relative O-Z invariants. We hope that the relative invariants may be used to study the general case (i.e. $g > 2$) for O-Z = 1.