Shake concordant knots that are not concordant. Preliminary report.

If $K$ is a knot in $S^3 = \partial B^4$, then the 4-manifold $W_K$ obtained by adding a single two-handle along $K$ with framing zero, has $H_2 \cong \mathbb{Z}$. The **shake genus of $K$** is the minimum genus of an embedded surface representing a generator of $H_2(W_K)$. The question was asked whether the shake genus is equal to the slice genus of $K$. In particular if the shake genus is zero then the knot is called shake slice. There has been no progress since 1976 on the question: is every shake slice knot a slice knot? We answer, in the negative, a relative version of this question. Specifically we show that there are many shake-concordant knots that are not concordant. We also show that none of the invariants $\tau$, $s$, slice genus, is invariant under shake concordance. (Received January 28, 2014)