# A generalization of the Murasugi sum of Seifert surfaces

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**Abstract.** The Murasugi sum is a natural operation to glue two Seifert surfaces. Let $F = G * H$ be a Murasugi sum of two Seifert surfaces $G$ and $H$. Then the following are well-known:

(i) $F$ is of minimal genus if and only if so are $G$ and $H$.

(ii) $F$ is a fiber surface if and only if so are $G$ and $H$.

In this talk, we generalize the notion of Murasugi sum by using surfaces other than a disk, and show that the operation also enjoys the above-mentioned properties.

Neumann & Rudolph have introduced the notion of "unfoldings" in $n$-dimensional knot theory. However, in case $n = 3$, all known examples of unfoldings are realized as decompositions of Murasugi sums. We give examples of our operation which are not Murasugi sums or "unfoldings". After formulating the gap between out operation and the Murasugi sum, we show that the gap can be arbitrarily large.