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**Title:** Tori and surfaces violating a local-to-global principle for rationality

**Abstract.** We show that even within a class of varieties where the Brauer obstruction is the only obstruction to the local-to-global principle for the existence of rational points (Hasse principle), this obstruction, even in a stronger, base change invariant form, may be insufficient for explaining counter-examples to the local-to-global principle for rationality.

We exhibit examples of toric varieties and rational surfaces over an arbitrary global field  $k$  each of those, in the absence of the Brauer obstruction, is rational over all completions of  $k$  but is not  $k$ -rational.