1125-57-445 **Arunima Ray*** (aruray@brandeis.edu), 415 South St MS 050, Waltham, MA 02453, and **Daniel Ruberman**. *4-dimensional analogues of Dehn's lemma.*

We investigate certain 4–dimensional analogues of the classical 3–dimensional Dehn's lemma, giving examples where such analogues do or do not hold, in the smooth and topological categories. In particular, we show that an essential 2–sphere S in the boundary of a simply connected 4–manifold W such that S is null-homotopic in W need not extend to an embedding of a ball in W. However, if W has abelian fundamental group (e.g. if W is simply connected) with boundary a homology sphere, then S bounds a topologically embedded ball in W. Moreover, we give examples where such an S does not bound any smoothly embedded ball in W. In a similar vein, we construct incompressible tori $T \subseteq \partial W$ where W is a contractible 4–manifold such that T extends to a map of a solid torus in W, but not to any embedding of a solid torus in W. Moreover, we construct an incompressible torus T in the boundary of a contractible 4–manifold W such that T extends to a topological embedding of a solid torus in W but no smooth embedding. As an application of our results about tori, we address a question posed by Gompf about extending certain families of diffeomorphisms of 3–manifolds which he has recently used to construct infinite corks. (Received September 02, 2016)