On four-manifolds with genus-1 simplified broken Lefschetz fibrations

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Abstract. In 2005, Auroux, Donaldson and Katzarkov introduced broken Lefschetz fibrations in order to understand near-symplectic structures via fibration structures. Simplified broken Lefschetz fibrations are broken Lefschetz fibrations with several conditions on topology and configuration of singularities. Although negative definite four-manifolds cannot admit near-symplectic structures, it turns out that every closed, oriented, connected four-manifold has a simplified broken Lefschetz fibration. In this talk, we first relate simplified broken Lefschetz fibrations to mapping class groups via monodromy representations. Using this relation, we then discuss the classification problem of genus-1 simplified broken Lefschetz fibrations.