

# Elliptic surfaces without 1-handles

Kouichi Yasui  
Graduate School of Science, Osaka University

**Abstract.** Harer-Kas-Kirby conjectured that the elliptic surface  $E(1)_{2,3}$  requires a 1-handle. The speaker previously constructed a 4-manifold which has the same Seiberg-Witten invariant as  $E(1)_{2,3}$  and has neither 1- nor 3-handles. Recently Akbulut proved that  $E(1)_{2,3}$  admits neither 1- nor 3-handles. In this talk, we prove that the elliptic surface  $E(n)_{p,q}$  ((p,q)=(2,3),(2,5),(3,4)) has no 1-handles. Our method is different from Akbulut.