On pseudo-fiber surfaces of level \( n \)

Yukari Funakoshi

Nara Women’s University

Abstract. The concept of pre-fiber surface in the 3-sphere \( S^3 \) was introduced by Kobayashi in [Ko]. In the paper, it is shown that any pre-fiber surface is transformed into a fiber surface by twisting is along arcs with certain properties. In this talk, we introduce pseudo-fiber surfaces of level \( n \) for each non-negative integer \( n \). (We note that a surface is a fiber surface if and only if it is a pseudo-fiber surface of level 0, and it is a pre-fiber surface if and only if it is a pseudo-fiber surface of level 1.) We show some fundamental properties of pseudo-fiber surfaces. Then we show that if an arc proper embedded in a pseudo-fiber surface of level \( n \) satisfies certain properties, then the twist along the arc transforms it into a pseudo-fiber surface of level \( n - 1 \). This gives a natural generalization of a result of Kobayashi’s. Finally we propose an application of pseudo-fiber surface for giving an estimation of unknotting numbers of fibered knots.