The dual knots of doubly primitive knots

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Abstract: It is one of the unsolved problems to decide the knots in the 3-sphere which have non-trivial Dehn surgery yielding a lens space. The concept of doubly primitive knots is introduced by Berge, and he proved that any doubly primitive knot admits Dehn surgery yielding a lens space. It is conjectured that Berge's construction is complete. Also, he proved that the dual knots (in lens spaces) of doubly primitive knots are $(1, 1)$-knots. This implies that it is important to study $(1, 1)$-knots with Dehn surgery yielding the 3-sphere as well as knots in the 3-sphere with Dehn surgery yielding lens spaces.

In this talk, we will give some results on $(1, 1)$-knots with Dehn surgery yielding the 3-sphere. In particular, we give a necessary and sufficient condition for such $(1, 1)$-knots to be hyperbolic.