

# Obtaining genus 2 Heegaard splittings from Dehn surgery

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Let  $K'$  be a hyperbolic knot in  $S^3$  and suppose that some Dehn surgery on  $K'$  with distance at least 3 from the meridian yields a 3-manifold  $M$  of Heegaard genus 2. We show that if  $M$  does not contain an embedded Dyck's surface (the closed non-orientable surface of Euler characteristic -1), then the knot dual to the surgery is either 0-bridge or 1-bridge with respect to a genus 2 Heegaard splitting of  $M$ . In the case  $M$  does contain an embedded Dyck's surface, we obtain similar results. As a corollary, if  $M$  does not contain an incompressible genus 2 surface, then the tunnel number of  $K'$  is at most 2.

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