On the Alexander polynomial satisfying Ozsváth-Szabó's condition for lens sugery

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P. Ozsváth and Z. Szabó [3] showed the following:

Theorem *Let K be a knot in S^3. If K yields a lens space, then the Alexander polynomial of K has the following form:*

$$\varDelta_K(t) = (-1)^m + \sum_{i=1}^{m} (-1)^{m-i}(t^{c_i} + t^{-c_i}) \quad (c_0 = 0 < c_1 < c_2 < \cdots < c_m)$$

Let $T(r,s)$ be an (r,s)-torus knot. The Alexander polynomial of $T(r,s)$ satisfies Ozsváth-Szabó's condition above. For a positive integer n, $\varDelta_{T(r,s)}(t^n)$ also satisfies the condition. We showed the following:

Main Theorem *Let K be a knot in S^3. If K yields a lens space and $\varDelta_K(t) = \varDelta_{T(r,s)}(t^n)$ where n is a positive integer, then we have $n = 1$.*

This theorem implies that Ozsváth-Szabó's condition does not characterize the Alexander polynomial of a knot in S^3 having a lens surgery.

References

[1] T. Kadokami, *On the Alexander polynomial satisfying Ozsváth-Szabó's condition for lens sugery*, preprint (2006).

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[3] P. Ozsváth and Z. Szabó, *On knot Floer homology and lens space surgeries*, Topology, **44** (2005), 1281–1300.

[4] M. Tange, *Ozsváth Szabó's correction term and lens surgery,* preprint (2006).