

# On the universal $sl_2$ invariant of ribbon bottom tangles

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**Abstract.** A bottom tangle is a tangle in a cube consisting of arc components whose boundary points are on a line in the bottom square of the cube. A ribbon bottom tangle is a bottom tangle whose closure is a ribbon link. For every  $n$ -component ribbon bottom tangle  $T$ , we prove that the universal invariant of  $T$  associated to the quantized enveloping algebra  $U_h(sl_2)$  is contained in a certain subalgebra of the  $n$ -fold completed tensor power of  $U_h(sl_2)$ . This result is applied to the colored Jones polynomial of ribbon links.