The Orthoplicial ball-packing and the ball number problem

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The ball number $ball(L)$ of a link L is the minimum number of balls needed in a necklace to construct L. Maehara established that $ball(\text{Hopf link}) = 8$ and gave an upper bound of $ball(\text{trefoil})$. By using the theory of ball-packings (based on the theory or hyperbolic Coxeter groups) developed by Boyd and Maxwell and later by Chen and Labbé, we give an upper bound of $ball(L)$ where L is an algebraic link. Our bound is linear on the number of crossings of L. If time allows, we also briefly mention some further applications of our approach.