**Meeting:** 1006, Lubbock, Texas, SS 8A, Special Session on Invariants of Links and 3-Manifolds

1006-57-175 **Jae-Wook Chung*** (jwchung@math.ucr.edu), Department of Mathematics, University of California, Riverside, Riverside, CA 92521, and **Xiao-Song Lin** (xl@math.ucr.edu), Department of Mathematics, University of California, Riverside, Riverside, CA 92521. *On n-punctured ball tangles.*

We consider a class of topological objects in the 3-sphere $S^3$ which will be called *n-punctured ball tangles*. Using the Kauffman bracket at $A = e^{\pi i/4}$, an invariant for a special type of $n$-punctured ball tangles is defined. The invariant $F$ takes values in $PM_{2\times 2^n}(\mathbb{Z})$, that is the set of $2\times 2^n$ matrices over $\mathbb{Z}$ modulo the scalar multiplication of $\pm 1$. This invariant leads to a generalization of a theorem of D. Krebes which gives a necessary condition for a given collection of tangles to be embedded in a link in $S^3$ disjointly. We also address the question of whether the invariant $F$ is surjective onto $PM_{2\times 2^n}(\mathbb{Z})$. We will show that the invariant $F$ is surjective when $n = 0$. When $n = 1$, $n$-punctured ball tangles will also be called spherical tangles. We show that $\det F(S) = 0$ or 1 mod 4 for every spherical tangle $S$. Thus $F$ is not surjective when $n = 1$. (Received February 14, 2005)