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A new type of non-topological bubbling solutions to a competitive Chern-Simons model

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Abstract. We study a non-Abelian Chern-Simons system in $\mathbb{R}^2$, including the simple Lie algebras A_2 and B_2. In a previous work, we proved the existence of radial non-topological solutions with prescribed asymptotic behaviors via the degree theory. We also constructed a sequence of bubbling solutions with only one component blowing up partially at infinity. In this paper, we construct a sequence of radial non-topological bubbling solutions of another type via the shooting argument. One component of these bubbling solutions locally converge to a non-topological solution of the Chern-Simons-Higgs scalar equation, but both components blow up partially in different regions at infinity at the same time. This generalizes a recent work by Choe, Kim and the second author, where the $SU(3)$ case (*i.e.*, A_2) was studied. Our result is new even for the $SU(3)$ case and also confirms the difference between the $SU(3)$ case and the B_2 case.

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