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Yan Cao, Georgia State University, Atlanta, GA 30303, **Guantao Chen***, Department of Mathematics and Statistics, Georgia State University, Atlanta, GA 30303, **Shushan He**, Georgia State University, Atlanta, GA, **Zhiquan Hu**, Central China Normal University, Wuhan, Peoples Rep of China, and **Feifei Song**, Central China Normal University, Wuhan, Peoples Rep of China.
Graph Knitting. Preliminary report.

A graph G is ℓ -knitted if for every $S \subseteq V(G)$ with $|S| = \ell$ and any partition $S_1|S_2|\dots|S_k$ of S , there exist vertex-disjoint connected subgraphs G_1, G_2, \dots, G_k such that $S_i \subseteq V(G_i)$ for each $i = 1, 2, \dots, k$. When the partitions are restricted to $|S_1| = |S_2| = \dots = |S_k| = 2$, graph G is called k -linked, which is a well-studied subject in graph theory. The notion of knitted graphs is not only a much broader topic but also has an application to the well-known Hadwiger's conjecture. We recently show that every 5ℓ -connected graph is ℓ -knitted and applied it to show that if there is a counterexample to Hadwiger's conjecture that every t -chromatic graph has a K_t -minor, then the minimum counterexample (in terms of graph minors) is $t/5$ -connected. In this talk, we will present problems surrounding this topic and some ideas of the proofs. (Received January 22, 2019)