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Adam Van Tuyl* (avantuy1@lakeheadu.ca), Department of Mathematical Sciences, Lakehead University, Thunder Bay, Ontario P7B5E1, Canada. *Sequentially Cohen-Macaulay Bipartite Graphs.*

Let G be a finite simple graph with vertex set $V_G = \{x_1, \dots, x_n\}$ and edge set E_G . Associate to G its edge ideal in the ring $R = k[x_1, \dots, x_n]$, that is, the ideal $I(G) = (x_i x_j \mid \{x_i, x_j\} \in E_G)$. We say that G is (sequentially) Cohen-Macaulay graph if the corresponding coordinate ring $R/I(G)$ is also (sequentially) Cohen-Macaulay. In this talk we consider the case of sequentially Cohen-Macaulay graphs under the extra hypothesis that G is bipartite. We show that the set of sequentially Cohen-Macaulay bipartite graphs is precisely the set of bipartite graphs whose independence complexes are vertex decomposable. We also give a formula for the Castelnuovo-Mumford regularity of $R/I(G)$ in terms of the invariants of G . (Received July 20, 2009)