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**Lakshmi Chandrasekaran\*** ([chandrasekaran.lakshmi@gmail.com](mailto:chandrasekaran.lakshmi@gmail.com)), 2020 Gravier street, New Orleans, LA 70112. *Stability of two cluster solutions in pulse coupled networks of neural oscillators.*

We study two reciprocally coupled clusters of pulse coupled oscillatory neurons. Using mathematical modeling and numerical simulations we prove rigorously the stability of the two cluster solution and show how reciprocal coupling can stabilize synchrony within clusters that cannot synchronize in isolation. These results suggest a mechanism by which reciprocal coupling between brain regions can induce local synchronization via the network feedback loop. (Received August 15, 2010)