1040-05-121 **Min Chih Lin** and **Jayme L Szwarcfiter*** (jayme@nce.ufrj.br), Universidade Federal do Rio de Janeiro, Instituto de Matemática, NCE and COPPE, Caixa Postal 2324, Rio de Janeiro, RJ 20001-970, Brazil. *Unit circular-arc graph representations and feasible circulations.*

A *Circular-arc (CA)* graph G is the intersection graph of arcs of a circle. The circle and the arcs form a *CA model* for G. A *unit circular-arc (UCA)* is a CA graph admitting a model, called *UCA model* with equal size arcs. Recently, Durán, Gravano, McConnell, Spinrad and Tucker formulated the first polynomial time algorithm, of complexity $O(n^2)$, for recognizing UCA graphs. However, such an algorithm did not construct UCA models. Moreover, they formulated the following open questions. (1): Is it possible to construct UCA models, in polynomial time ? (2): Is it possible to construct UCA models, whose extreme of the arcs correspond to integers of polynomial size ? (3): If (2) is true, can such a model be constructed in polynomial time ? In the present talk, we describe a new characterization for UCA graphs leading to affirmative answers to these questions. We construct, in linear time, a UCA model whose extreme of the arcs correspond to integers of $O(n)$ size. The characterization also leads to a linear time recognition algorithm. The method is based on network circulations. We obtain a linear time algorithm for finding a feasible circulation, if existing, in a network with non negative real lower capacities and unbounded upper capacities. (Received January 29, 2008)