The design of nonuniformly spaced linear array antennas using Particle Swarm Optimization method is considered. The purpose is to match a desired radia- tion pattern and improve the performance of these arrays in terms of sidelobe level. This performance criterion determines how well the system is suitable for wireless communication applications and interference reduction. Two approaches are consid- ered: in the first, the design of element placement with the constraint of array length being imposed is performed. The second is based on element position perturbation starting from a uniform element distribution. Many examples are treated to show the effectiveness of the designs and the effect some other parameters might have on the overall performance of the array