Increasing the Life Time of SR Sources by RF Phase Modulation, N. HERTEL, S.L. LUNT, S.P. MØLLER, J.S. NIELSEN, YU. SENICHEV, ISA, Aarhus University - The main effect restricting the life time in synchrotron light sources is the intrabeam scattering Touschek effect. We have developed a method of RF field phase modulation based on the longitudinal non-linear resonance excitation resulting in particle re-distribution in the longitudinal plane. It gives a lower density in the bunch core and consequently a lower probability of the intrabeam scattering. The equilibrium longitudinal emittance is determined by the balance of the quantum excitation and the radiation damping processes. We modify this balance for the growth of the phase area, occupied by the particles in the central part of the longitudinal plane. We show that phase modulation with a frequency three times higher than the synchrotron oscillation excites the core growth with an increment bigger than the decrement of the radiation damping process. The model will be compared to measurements made at the ASTRID storage ring