Coalescence Processes of Ag Nanoparticles. A case of Surface Plasmon Resonances.\textsuperscript{1} EDISON DA SILVA, Instituto de Fisica, Unicamp, Campinas, SP, Brazil., GIOVANI FACCIN, Faculdade de Ciencias Exatas e Tecnologicas, UFGD, Dourados, MS, Brazil., MIGUEL SAN MIGUEL, Instituto de Quimica, Unicamp, Campinas, SP, Brazil., JUAN ANDRES, Departamento de Quimica Fisica i Analitica, UJI, Universitat Jaume I, Castellon de la Plana, Spain., ELSON LONGO, Instituto de Quimica, UNESP, Araraquara, SP, Brazil. — A novel process, the formation and growth of metallic Ag nanowires (NWs) and nanoparticles (NPs) on Ag\textsubscript{2}WO\textsubscript{4} upon electron beam irradiation has been discovered and was extensively investigated by different experimental techniques, transmission electron microscopy (TEM), field emission scanning electron microscopy (FE-SEM), energy dispersive spectroscopy (EDS) characterization, among others. Ag metallic NWs grow on Ag\textsubscript{2}WO\textsubscript{4}, and further observation showed the formation of Ag NPs formed from the Ag filaments during exposition to the electron beam. The present work concentrates in the study and the understanding of physical processes that occur with these new Ag NPs an their interaction. The experiments found the formation of Ag NPs of sizes from 2 to 15 nm. These NPs produced in vacuum show very interesting behavior displaying coalescence effects with two nearby NPs forming other large particles. Associating theory and computer simulations we model this evolution process that is driven by plasma resonance effects due to the electron beam.

\textsuperscript{1}Work is supported by CNPq, CAPES and FAPESP and FAEPEX. CENAPAD-SP and IFGW are acknowledged for computer time.

Edison da Silva
Instituto de Fisica, Unicamp, Campinas, SP, Brazil.

Date submitted: 09 Nov 2016
Electronic form version 1.4