Search for supersymmetry in final states with three leptons and missing transverse momentum in $\sqrt{s} = 7$ TeV $pp$ collisions with the ATLAS detector — A search for the direct production of weak gauginos in final states with three leptons and missing transverse momentum is presented. An integrated luminosity of 4.7 fb$^{-1}$ of $\sqrt{s} = 7$ TeV proton-proton collision data delivered by the Large Hadron Collider and recorded with the ATLAS detector has been analyzed. Consistency with Standard Model expectations was observed in three signal regions that are either depleted or enriched in Z-boson decays. Upper limits at 95% confidence level have been set in the parameter spaces of the phenomenological minimal supersymmetric Standard Model and simplified models.