In our work in the first time stationary ultracold plasma was prepared via continuous wave optical excitation. Studies of the plasma were performed in working magneto-optical trap by using cw lasers. The fluorescence resonances of Ca-40 ions on transition $4^2S_{1/2} - 4^2P_{1/2}$ were recorded. Dependence of resonance width on electron energy above the ionization potential was measured. For estimations of ion temperature we used the measured width. The work is supported by grant of President RF MD-2189.2019.2.