The ground state and doubly excited $^{1,3}P^o$ states of the plasma-embedded Li$^+$ ion[1] SABYASACHI KAR, Y.K. HO, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan, ROC — With the recent advancement for laser plasmas in laser fusion laboratories [1] and with the recent experimental measurement on the doubly excited resonances in photo-ionization spectrum of Li$^+$ using the photon-ion merged-beam at the Advanced Light Source [2], it is of interest to investigate the bound states and resonance states of Li$^+$ under the influence external environments produced by the charge-neutral background such as that of a plasma. The plasma effect is taken care of by using a screened Coulomb potential obtained from the Debye model. A correlated wave function has been used to represent the correlation effect between the charged particles. The ground state of Li$^+$ in plasmas for different screening parameters has been estimated in the framework of Rayleigh-Ritz variational principle. In addition, a total of 18 resonances (9 each for $^1P^o$ and $^3P^o$ states) below the $n =2$ Li$^+$ thresholds has been estimated by calculating the density of states using the stabilization method. The resonance energies and widths for various Debye parameters ranging from infinity to a small value for these $^{1,3}P^o$ resonance states are reported. [1] S . NaKai, K. Mima, *Rep. Prog. Phys.* **67**, 321 (2004). [2] S. W. J. Scully *et al*, *J. Phys. B* **39**, 3957 (2006).

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