

Localization-delocalization transition in interacting one-dimensional fermion systems: H. Fukuyama, ISSP, Tokyo Univ.

Electrons in one-dimensional disordered systems exhibit Anderson localization in the absence of mutual interactions. However the transition is possible between localized and delocalized state as the interaction is turned on.<sup>1)</sup> In this paper such interplay between Anderson localization and interactions has been examined<sup>2)</sup> for spin dependent Tomonaga model<sup>3)</sup> based on the phase Hamiltonian derived by the bosonization of the fermion field.<sup>4)</sup> The problem is the extension of the classical impurity pinning of the charge density wave<sup>5)</sup> to that of quantum systems with phase variables of not only charge but also spin. The critical value of the interaction constant has been derived by the use of selfconsistent-harmonic approximation to the nonlinearity. 1) W. Apel, J. Phys. C. 15 (1982) 1973; W. Apel and T.M Rice, Phys. Rev. B26 (1982) 7063, 2) Y. Suzumura and H. Fukuyama, J. Phys. Soc. Jpn. 52 (1983) 2870, 3) For review, J. Solyom, Adv. Phys. 28 (1979) 201, 4) Y. Suzumura, Prog. Theor. Phys. 61 (1979) 1, 5) H. Fukuyama and P.A. Lee, Phys. Rev. B17 (1978) 535.