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1003-35-477 **Guoping Zhang*** (gzhang@desu.edu), Department of Mathematics, Delaware State University, Dover, DE 19901, and **Fengshan Liu**, Department of Mathematics, Delaware State University, Dover, DE 19901. *Local Smoothing Property of Solutions for Nonlinear Schrödinger Equations with Potentials Superquadratic at Infinity*. Preliminary report.

The aim of this work is to investigate the smoothing property of the solution of the following initial value problem for the nonlinear Schrödinger equation

$$\begin{cases} i\partial_t u = -\Delta u + V(x)u + f(x, u), & (t, x) \in \mathbb{R} \times \mathbb{R}^n, \\ u(x, 0) = u_0(x) \in \mathcal{H}^s, & x \in \mathbb{R}^n, \end{cases} \quad (1)$$

with the potential V superquadratic at infinity, in the sense that V grows faster than $C|x|^{2+\varepsilon}$ at infinity, for constants $C > 0$ and $\varepsilon > 0$. Where $\mathcal{H}^s = \{u \in L^2(\mathbb{R}^n) : H^{s/2}u \in L^2(\mathbb{R}^n)\}$ and $H = -\Delta + V(x)$.

In the previous works we studied systematically the local smoothing properties of linear Schrödinger equation with the potential superquadratic at infinity. In this work we make use of the results obtained in the previous works to prove that the solution for the initial value problem (1.1) with fractional s has a higher order regularity than s . (Received September 15, 2004)