Erratum to « An Asimptotic Expansion for the Green's Function of Nonrelativistic Potential-Scattering Theory and the Asymptotic Character of the Born Series for the Jost Function for Large Complex Angular Momentum ».

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As has been kindly pointed out to me by Dr. S. KLARFELD, there are two errors in the discussion of fast-decreasing potentials in my paper in *Nuovo Cimento*, **42 A**, 39 (1966). The first error is in the asymptotic estimate in eqs. (4.41) and (4.42), which should read:

$$\int_0^{\infty} \exp[-p^2 r^2] J_{\frac{1}{2}}^2(kr) r dr = O \left[\lambda^{-\frac{1}{2}} \left(\frac{ek^2}{4p^2 \lambda} \right)^{\frac{1}{2}} \right] \text{ as } |\lambda| \rightarrow \infty$$

and

$$|f_B^-(\lambda, k)| \underset{\lambda \rightarrow i\infty}{\sim} \text{const } |\lambda|^{-\frac{1}{2}} \exp \left[\frac{1}{2} \pi \text{Im } \lambda \right],$$

respectively.

The second error is in the discussion at the end of Sect. 6. As indeed follows from the corrected form of eq. (4.41), eq. (6.5) is not valid for the Gauss potential. This means that in order for the contributions from small r to dominate the high- λ behaviour of the scattering amplitude, the potential must decrease faster than the Gauss potential. Taking $V(r) = g \exp[-r^\beta]$, $\beta > 2$, one gets from eq. (6.4), or directly from the Born approximation integral, using the series for $J_{\frac{1}{2}}^2(kr)$ of Watson, p. 147, that

$$\Delta f(\lambda, k) = O \left[\left(\frac{k}{2} \right)^{2\lambda} \frac{\Gamma(2(\lambda+1)/\beta)}{\Gamma^2(\lambda+1)} \right] \approx O(\lambda^{-2(1-\beta^{-1})\lambda}), \quad \lambda \rightarrow +\infty, \quad \beta > 2.$$

This result is probably valid for all $\beta > 1$. We see that eq. (6.5) is in fact only valid in the limit $\beta \rightarrow \infty$, corresponding to a cut-off potential. The order of the

total amplitude as an entire function of t now becomes

$$\varrho = \frac{1}{2(1 - \beta^{-1})}$$

and $\varrho = \frac{1}{2}$ occurs only in the limit $\beta \rightarrow \infty$.

Thus, it seems that even for fast-decreasing potentials, with a potential tail $\exp[-r^\beta]$, $1 < \beta < \infty$, the high- λ behaviour of the partial-wave amplitude and the high- t behaviour of the total amplitude are determined by the tail of the potential, and not by the contributions from small r . However, the dominating contributions can be seen to come from $r < |\lambda/k|$, contrary to the case for slowly decreasing potentials. Therefore, the discussion in connection with eqs. (4.38) and (4.39) concerning the behaviour of the Jost function in complex directions, $0 < \arg \lambda < \frac{1}{2}\pi - \varepsilon$, $\varepsilon > 0$, is not affected.