

Low-energy scattering

$$E \rightarrow 0 \quad (37)$$

$$\psi(r) \underset{r \rightarrow \infty}{\stackrel{(1)}{=}} 1 + \frac{f}{r} \quad (38)$$

⇓

There is no θ -dependence in ψ (39)

$$f \underset{\substack{(37, 39 \\ 23)}}{=} - \frac{m}{2\pi\hbar^2} \int U(r) \psi(r) d^3r \quad (40)$$

No θ -dependence in f

$$f = -a \quad (41)$$

$$(38) \Rightarrow \psi \text{ - real} \quad (40) \Rightarrow a \text{ - real} \quad (42)$$

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$$\frac{d\sigma}{ds_2} = |f|^2 = \lambda^2 \quad (43)$$

$$\sigma_{tot} = 4\pi \lambda^2 \quad (44)$$