

Izpeljave, ki smo jih naredili na predavanjih:

$$h \ll r \rightarrow |\vec{r} - \vec{r}_i| \approx r \mp \frac{h}{2} \cos \Theta$$

$$e^{-jk|\vec{r} - \vec{r}_i|} \approx e^{-jk\left(r \mp \frac{h}{2} \cos \Theta\right)} = e^{-jkr} e^{\pm \frac{jkh}{2} \cos \Theta}$$

$$e^{\pm ju} = \cos u \pm j \sin u$$

$$e^{-jk|\vec{r} - \vec{r}_i|} \approx e^{-jkr} \left[\cos\left(\frac{kh}{2} \cos \Theta\right) \pm j \sin\left(\frac{kh}{2} \cos \Theta\right) \right]$$

$$h \ll 1/k \rightarrow \cos\left(\frac{kh}{2} \cos \Theta\right) \approx 1 \quad \pm j \sin\left(\frac{kh}{2} \cos \Theta\right) \approx \pm \frac{jkh}{2} \cos \Theta$$

$$e^{-jk|\vec{r} - \vec{r}_i|} \approx e^{-jkr} \left(1 \pm \frac{jkh}{2} \cos \Theta \right)$$

$$h \ll r \rightarrow \frac{1}{|\vec{r} - \vec{r}_i|} \approx \frac{1}{r \mp \frac{h}{2} \cos \Theta} = \frac{1}{r} \frac{1}{1 \mp \frac{h}{2r} \cos \Theta} \approx \frac{1}{r} \left(1 \pm \frac{h}{2r} \cos \Theta \right)$$

Pri vseh zanemaritvah upoštevamo dva največja člena pri razvoju v vrsto.