

Answers to practice exam:

1. a)  $v=0.526c$ ; b) 0.85 yr;

2. a)  $P_{\text{tot}} = 0.375 \text{ MeV}/c$ ; b)  $E = 1.125 \text{ MeV}$ ; c) No (Doppler shift relative to the center of mass frame of reference)

3. a)  $1.22 \times 10^{-7} \text{ m}$ ; b) 8; c)  $\hbar^*[-3\dots3]$ ;

4. b)  $\Delta V > \hbar/(2mL)$ ; c) 0; d) 2%; f)  $2 \times 10^6 \text{ m/s}$

5. a) 0; b)  $3/2 a_0$

6. 1 line: He; 2 lines: H, Li.