(6.3) A beam of protons pass through a homogeneous magnetic field of 0.5 T. In the beam there is a small high frequency coil which can act on the main field so that the proton spin flips into the opposite direction. At which frequency would this occur?

$B_n := 5.050787 \cdot 10^{-27} \cdot \frac{joule}{tesla}$ (=μ_N in App. III) $h := 6.626076 \cdot 10^{-34} \cdot joule \cdot sec$

$B := 0.5 \cdot tesla$

For p^+ we get from Table 6.3: $\mu_I := 2.793 \cdot B_n$ $I := \frac{1}{2}$ $m_I := I$

However, $\Delta E = \boldsymbol{h}^* \nu$ and $E = B^* \mu_I^* \cos(\theta)$. Hence, because $\cos(\theta)$ switches sign, we get

$\nu := \frac{2 \cdot B \cdot \mu_I}{h}$ $\nu = 21.29 \cdot MHz$