Calculation of maximum D momentum

In the decay of $B \to Dl + \nu$, 4-momentum of each particles are conserved

$$p_B = p_D + p_{l\nu}$$

In the B rest frame

$$p_D = (E_D, \vec{p}), \quad p_{l\nu} = (E_{l\nu}, -\vec{p}) \simeq (|\vec{p}|, -\vec{p})$$

Hence

$$\begin{aligned} & p_B^2 = (p_D + p_{l\nu})^2 = p_D^2 + p_{l\nu}^2 - 2p_D \cdot p_{l\nu} \\ & \Rightarrow m_B^2 = m_D^2 + 0 + 2(E_D|\vec{p}| + |\vec{p}|^2) \end{aligned}$$

Supposing $m_D \simeq |\vec{p}| \equiv p$, we get

$$2p(\sqrt{2}p + p) = m_B^2 - m_D^2$$

Hence

$$p = \sqrt{\frac{m_B^2 - m_D^2}{2(\sqrt{2}+1)}} = \sqrt{\frac{5^2 - 2^2}{2(1.41+1)}} = 2.4\text{GeV}$$