8.3. 1. $V = V_{+}e^{-j\beta z} + V_{+}|p|e^{j(\theta p + Bz)}$ $= V_{+}e^{-jBz} + V_{+}|p|e^{j(\theta p + Bz)} + V_{+}|p|e^{j(\theta p + Bz)}$ $= V_{+}e^{-jBz} + V_{+}|p|e^{j(\theta p + Bz)} + (1 - |p|)V_{+}e^{-jBz}$ $= V_{+}|p|e^{j(\theta p + Bz)} (2 \cosh(j(\theta p + Bz)) + (1 - |p|)V_{+}e^{-jBz}$ $= V_{+}|p|e^{j(\theta p + Bz)} \cos(\theta v + Bz) + (1 - |p|)V_{+}e^{-jBz}$ $= 2V_{+}|p|e^{j(\theta p + Bz)} \cos(\theta v + Bz) + (1 - |p|)V_{+}e^{-jBz}$

travelling wave

Standing wave

V(z,t)= Re[V(z)e 3wt] = Re[(2V+1p1e)0p/2cos(00/2+B2)+(1-p1)4e-182)e Jut] = Re [2 V+ lple (OP/2+WE) cos (OP/2 +BZ) + (1-1pl) V, e (wt-BZ)7 = Re [2V+1pl(cos (0P/2 +wt) +jsin (0P/2 +wt)) Cos(0P/2 +BZ) + (1-101) Vx(cos (wt-82) + ; sin (wt-82)) = 2 V+ 1pl cos(0/2 + wt) cos (0/2 + Bz) + (1-1pl) V+ cos (wt-Bz) wt = wt, + 7/4 wt= 0 1/2 > wt = 1/4 - 0 1/2 V(Z,t) = 24/plcos(0/2+ 1/4-0/2)cos(0/2+Bz)+(1-1pl)V+cos(1/4-0/2-Bz) = 2 V4 1pl cos (2/4) cos (8/2+BZ)+(1-1pl) V4 Cos (2/4-8/2-8Z) = 2 4/p/cos(08/2+B2)+(1-101) V+ cos(7/4-08/2-B2) + cos(T/4)-00/2-BZ) = cos(T/4) cos(-00/2 182)-sin(T/4) sin(-00/2 182) = 1= cos (0% +Bz) + 5= sm (0% +Bz) = = = 1 (1+1p1) cos (0% +B2) + = (1-1p1) 4 sin (0% +B2)

 $\begin{aligned} |\rho| &= \frac{1}{2} \\ V(2,t) &= \frac{1}{2} V_{+} (1+\frac{1}{2}) \cos \left(\frac{Q_{2}}{2} + \frac{1}{2} \frac{1}{2} \right) + \frac{1}{2} (1-\frac{1}{2}) V_{+} \sin \left(\frac{Q_{2}}{2} + \frac{1}{2} \frac{1}{2} \right) \\ &= \frac{3}{3 J_{2}} V_{+} \cos \left(\frac{Q_{2}}{2} + \frac{1}{2} \frac{1}{2} \right) + \frac{1}{2} \sin \left(\frac{Q_{2}}{2} + \frac{1}{2} \frac{1}{2} \right) \\ &= \frac{3}{2 J_{2}} V_{+} \left[\cos \left(\frac{Q_{2}}{2} + \frac{1}{2} \frac{1}{2} \sin \left(\frac{Q_{2}}{2} + \frac{1}{2} \frac{1}{2} \right) \right] \end{aligned}$