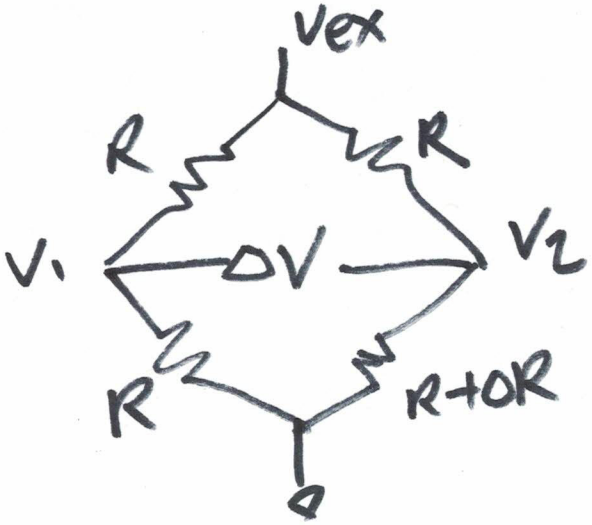
Wheatstone Bridge

① Quater Bridge



$$\Delta V = V_2 - V_1$$

$$= Vex\frac{R+\Delta R}{R+R+\Delta R} - \frac{1}{2}Vex$$

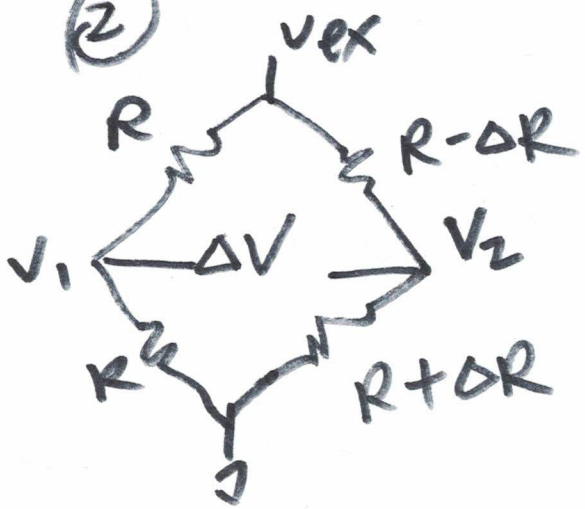
$$= Vex\frac{R+\Delta R}{2R+\Delta R} - \frac{Vex}{2}$$

$$= Vex\left(\frac{2R+2\Delta R-(2R+\Delta R)}{2(2R+\Delta R)}\right)$$

$$= Vex\frac{\Delta R}{4R+2\Delta R}$$

$$\approx Vex\frac{\Delta R}{4R}$$

(2) Half Bridge



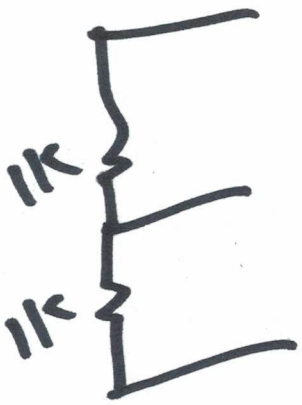
$$\Delta V = V_2 - V_1$$

$$= Vex\left(\frac{R+\Delta R}{2R}\right) - Vex\frac{1}{2}$$

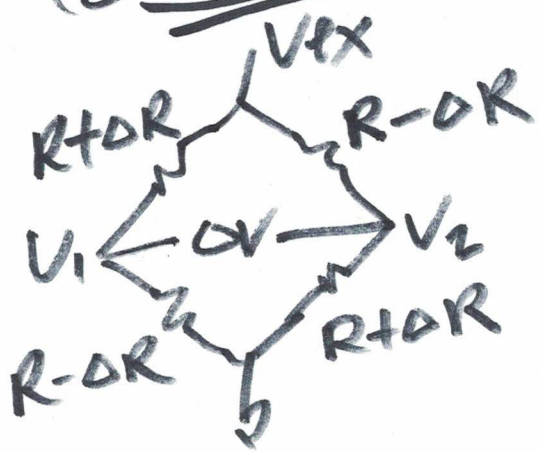
$$= Vex\left(\frac{R+\Delta R}{2R} - \frac{1}{2}\right)$$

$$= Vex\left(\frac{R+\Delta R - R}{2R}\right)$$

$$= Vex\,\frac{\Delta R}{2R}$$



③ Full Bridge



$$\delta V = V_2 - V_1$$

$$= Vex\frac{R+\delta R}{2R} - Vex\frac{R-\delta R}{2R}$$

$$= Vex\frac{\cancel{R}+\delta R-\cancel{R}+\delta R}{2R}$$

$$= Vex\frac{2\delta R}{2R} = Vex\frac{\delta R}{R}$$