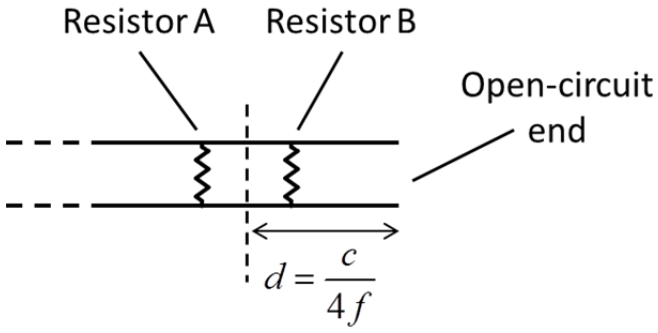

Here, two resistors are placed on either side of the position of the node in the open-circuit line case. We presume we make these resistors rather large values compared to the line impedance so that, though they are not sitting at the node position, there is relatively little current flowing through them and so they do not greatly perturb the standing wave on the line. If the frequency rises higher, the node moves to the right, so there is less power dissipated in Resistor B and more in Resistor A. Hence, if we measured the temperature difference between these resistors, higher temperature in Resistor B compared to Resistor A would indicate somewhat higher frequency in the line. Conversely, moving to lower frequency would move the node towards Resistor A giving the opposite temperature difference. Hence measuring the temperature difference between these resistors could gives a measure, with an appropriate sign, of changes in the signal frequency in the line.

Notes

It is not hard to come up with an approach that tells you that the frequency is off – just looking for a finite voltage across the resistor in the circuit of Supplementary Question 1 will tell you that. The tricky part is to come up with something that also tells you the sign – i.e., whether your frequency is above or below. That requires that you compare to something. The solution shown above does that, in this case in a symmetric way that makes it easy to get the sign without any calculations.