

Bridge Problem 04-01-21

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<paul@cim.mcgill.ca> (26)FDXdc41u.tex

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1 Out of Balance Signal

A strain gage changes resistance in proportion to elongation (tension) or contraction (compression) strain. It is used in the nominal range $\pm 100 \rightarrow 1000 \mu\epsilon$ where $\mu\epsilon \equiv$ microstrain. Recall that a typical 300Ω , at zero strain, gage reads 300.3Ω at $1000\mu\epsilon$. What is the output (V) of a two arm, $5V$ excited bridge if the gages are mounted to take advantage of equal magnitude tension and compression, respectively, like in the cantilever force/displacement transducer, when they read $\pm 650\mu\epsilon$? Show a sketch of the bridge with up and down arrows on the appropriate gage resistors to indicate where to place the tension and compression gage, respectively, in the bridge circuit. Refer to Fig. (26)Brdgs41u. Label the values of all four gage resistors.

2 Next Week's Problem

The next question will address the *design* of a cantilever force/displacement transducer.

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