Oefenopgaven EE1320 Meettechniek – college 3: Sensor uitlezing[1]

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Regtien: opgave 5.9, 12.6, 12.7, 12.8, 13.1, 13.2, 13.3

Optioneel ter opfrissing opamp kennis: Regtien 12.1, 12.2, 12.3, 12.4

The capacitive differential sensor shown in Fig. 6.33 is read out using the opamp circuit shown. The parallel plate approximation can be used for the sensor: $C_1 = \varepsilon \times D \times (L-x)/h$ and $C_2 = \varepsilon \times D \times (L+x)/h$, where ε denotes the dielectric constant and D, L and h the dimensions shown in the figure. The lateral displacement is x.

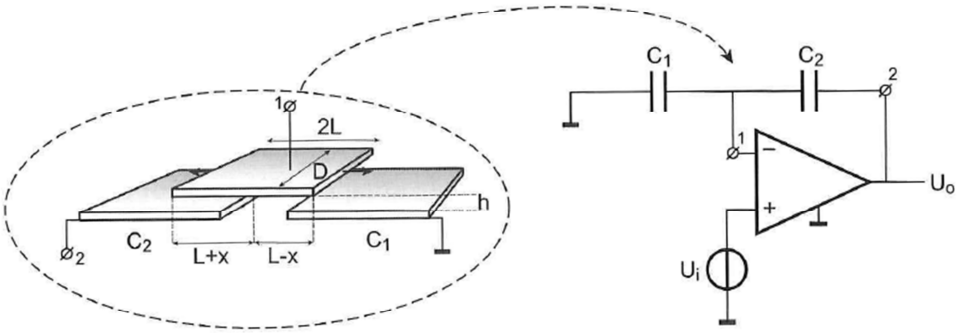

Figure 6.33,

6.3 Derive the expression for the transfer function U_o/U_i of the opamp feedback circuit shown in Fig. 6.33.

[1] De weergegeven opgaven die niet uit Regtien komen zijn afkomstig uit
R.F. Wolffenbuttel, "Measurement of Electrical and Non-electrical quantities", editie 2010.