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% Lab 2, uppgift 3
% Linjärisering av NTC-motstånd

% Konstanter
alpha = 3977;   %kelvin
R25   = 2.2e3;  %ohm
TA    = 293;    %kelvin
TB    = 313;    %kelvin
TC    = 333;    %kelvin
T     = TA:TC;  % Temp. intervallet vi vill linjärisera.

% NTC resistans vid TA, TB & TC.
R_TA = R25*exp(alpha * ((1 / TA) - (1 / 298)))
R_TB = R25*exp(alpha * ((1 / TB) - (1 / 298)))
R_TC = R25*exp(alpha * ((1 / TC) - (1 / 298)))

% Resistans R_lin som ger ett approx. linjärt område.
Rlin = (R_TA*R_TB + R_TB*R_TC - 2*R_TA*R_TC) / (R_TC + R_TA - 2*R_TB)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Grafer
hold off

% Beräkna alla resistanser inom temp.intervallet
R_T =  R25.*exp(alpha .* ((1 ./ T) - (1 ./ 298)));

hold on

subplot(2,1,1)
plot( T, R_T, 'k')
title('R_T vs. Temp')
grid on

subplot(2,1,2)
plot( T, (Rlin ./ (Rlin + R_T)), 'k')
title('U_R vs. Temp (efter linjärisering med R_{lin} = 860ohm)')
xlabel('20°C <= Temp. <= 60°C')
grid on


R_TA =

     2.7627e+003


R_TB =

     1.1605e+003


R_TC =
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   541.0534e+000

Rlin =

   859.5428e+000
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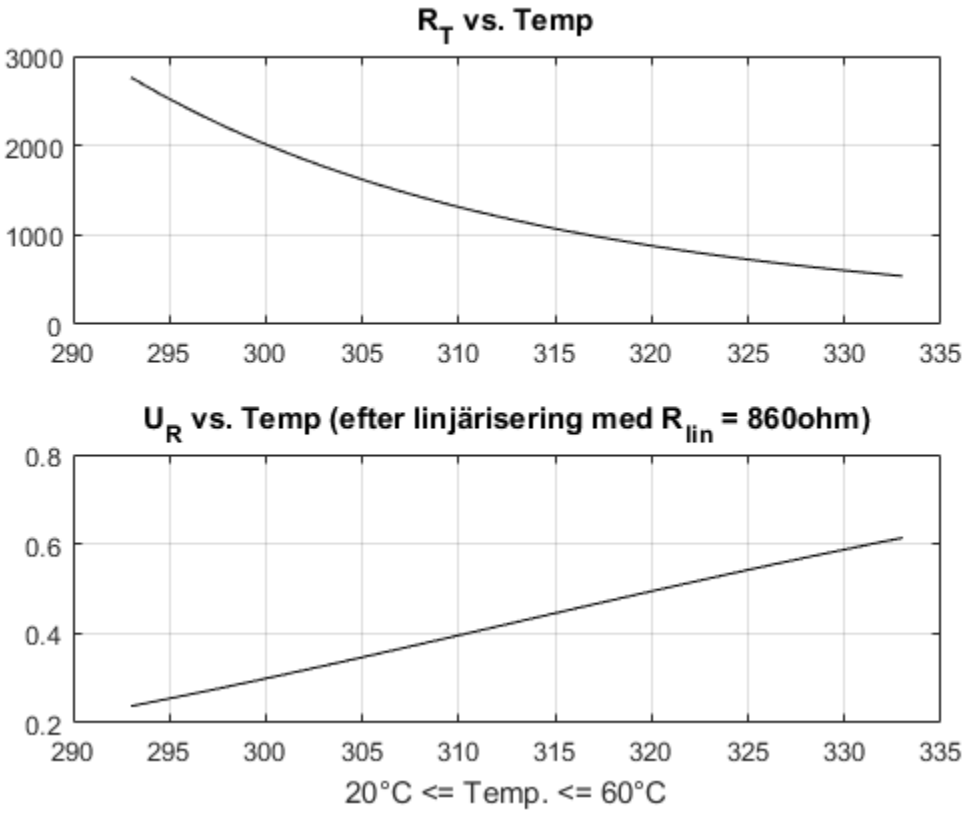

Published with MATLAB® R2016b