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function characteristic_curves_2
% characteristic curves for Zhou Turbine
%   written by Kristina Franke on Mar 25th, 2014

%figure window set-up
f=figure('visible','off','position',[360,700,1000,755]);
hP=uicontrol('style','text','string','Polyfit 3','position',[800,395,70,15]);
hXi=uicontrol('style','text','string','Polyfit 3','position',[800,10,70,15]);
haP=axes('units','pixels','position',[50,445,900,285]);
haXi=axes('units','pixels','position',[50,60,900,285]);

%data from Zhou Turbine
c2=[1;1.3;1.6;1.85;2;2.25;2.6;3;3.2;3.75;4];
A=[1;2;3;4;4.4;5;6;6.6;7;8;8.4];
P_el=A*12;
V_dot=c2*0.077;
Xi_el=(2*P_el*(0.077^2))./(1000*0.8*V_dot.^3);
%plot(haP,V_dot,P_el); %Power
%plot(haXi,V_dot,Xi_el); %Xi

%curve fitting
x=[0.06:0.001:0.32];
p=polyfit(V_dot,Xi_el,3);
q=polyfit(V_dot,P_el,3);
y=polyval(p,x);
z=polyval(q,x);
plot(haXi,V_dot,Xi_el,x,y);
plot(haP,V_dot,P_el,x,z);
ylabel(haP,'Power Output / W');
xlabel(haP,'Flow Rate / m^3/s');
ylabel(haXi,'Xi-Turbine');
xlabel(haXi,'Flow Rate / m^3/s');

%figure window finalisation
set(f,'name','Turbinenkennlinien_2');
movegui(f,'center');
set(f,'visible','on');

%p =

%   10.5752   -0.1225   -2.7559    0.6067


%q =

%   1.0e+03 *

%    1.9891   -2.0277    0.9206   -0.0488

end
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