

# Определение лучших коэффициентов

```
clear all
close all
path = 'D:\Desktop\Studie\Diploma\Audio data\wav\60 нот.wav';
[y, Fs] = audioread(path);
z = y(:,1);
clear y
```

Сокращенный подсчет нулей

```
Samples_num = 1024;
zeros_num = Fs - Samples_num;
Zer = zeros(zeros_num, 1);
cuts = floor( length(z) / Samples_num ) - 1;
notes_lin = zeros(1, cuts);
```

Подготовка матрицы A

```
Tab_F_1 = [65.41 69.3 73.42 77.78 82.41 87.31 92.5 98 103.83 110 116.54 123.47];
k = 2.^{0:6};
Tab_F = k' * Tab_F_1;
FlatTab_F = reshape(Tab_F.',1,[]);
v = 1:3;
A = v' * FlatTab_F;
A_ind = floor(A);

A_ind(A_ind>15000) = 15000;
FlatA_ind = reshape(A_ind.',1,[]);
```

Поиск Коэффициентов

```
for j = 0:0.1:1.5
    for k = 0:0.1:1.5

        hk = [1 k j]; % Исследуемый параметр
        notes_lin = zeros(1, cuts);

        for i = 1:cuts

            n1 = i*Samples_num; % Задаю пределы для вырезания участка сигнала
            n2 = n1 + Samples_num - 1;

            S = z(n1: n2); % Берем участок сигнала
            S2 = vertcat (Zer, S); % Интерполируем спектр
            Spec = abs(fft(S2)); % Находим спектр сигнала
            Notes_matrix = Spec(A_ind); % Заполняем матрицу гармоник каждой ноты
            Notes_vector = hk * Notes_matrix; % Находим сумму для каждой ноты
            [Val, Ind] = max(Notes_vector); % Нахожу индекс максимума
            notes_lin(i) = Ind; % Сохраняю текущую ноту

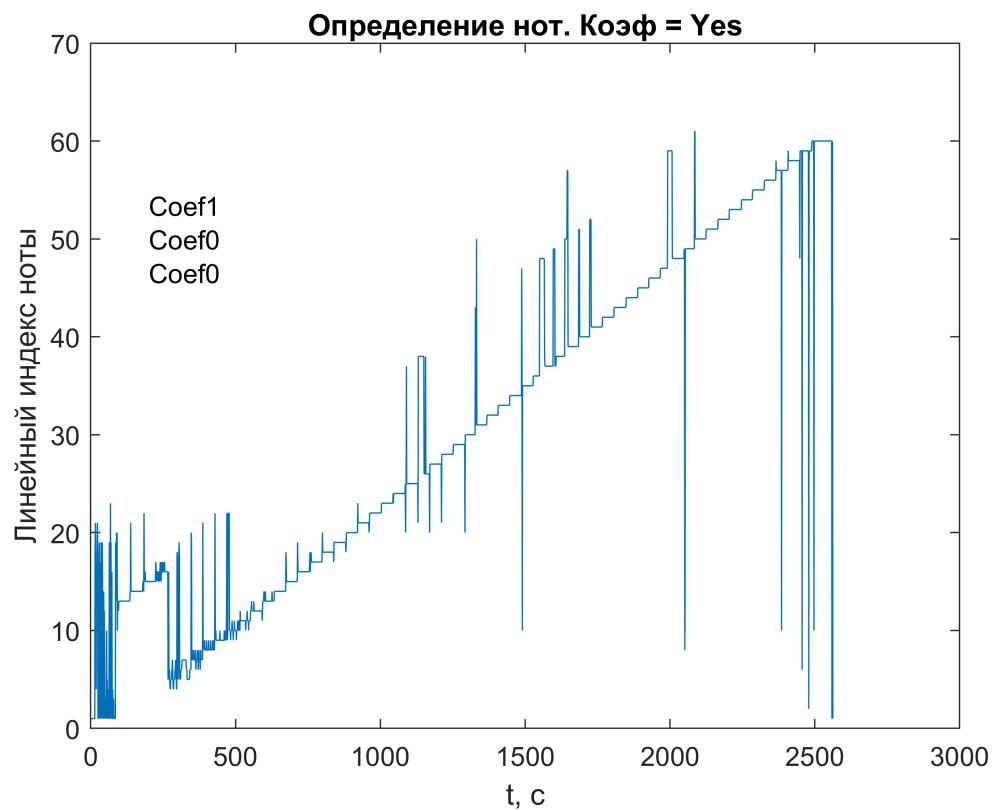
        end
    end
```

```

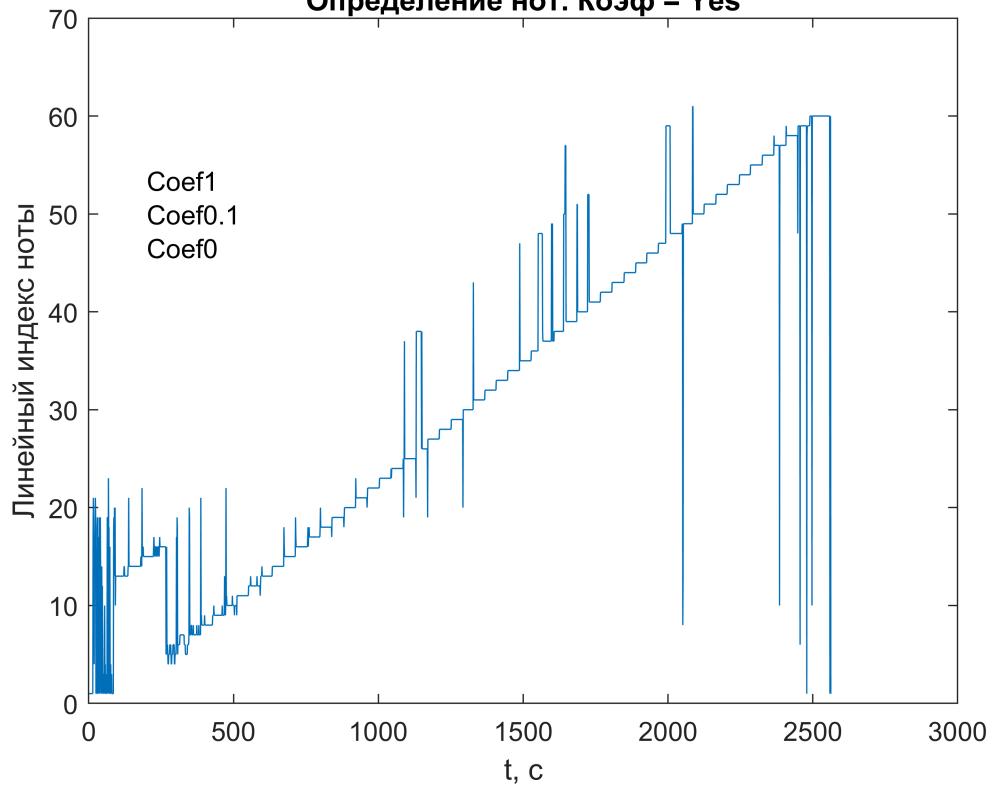
figure
plot(notes_lin)
xlabel("t, c")
ylabel("Линейный индекс ноты")
title("Определение нот. Коэф = Yes")
text(200, 50, 'Coef' + string(hk))
ylim([0 70])

end
end

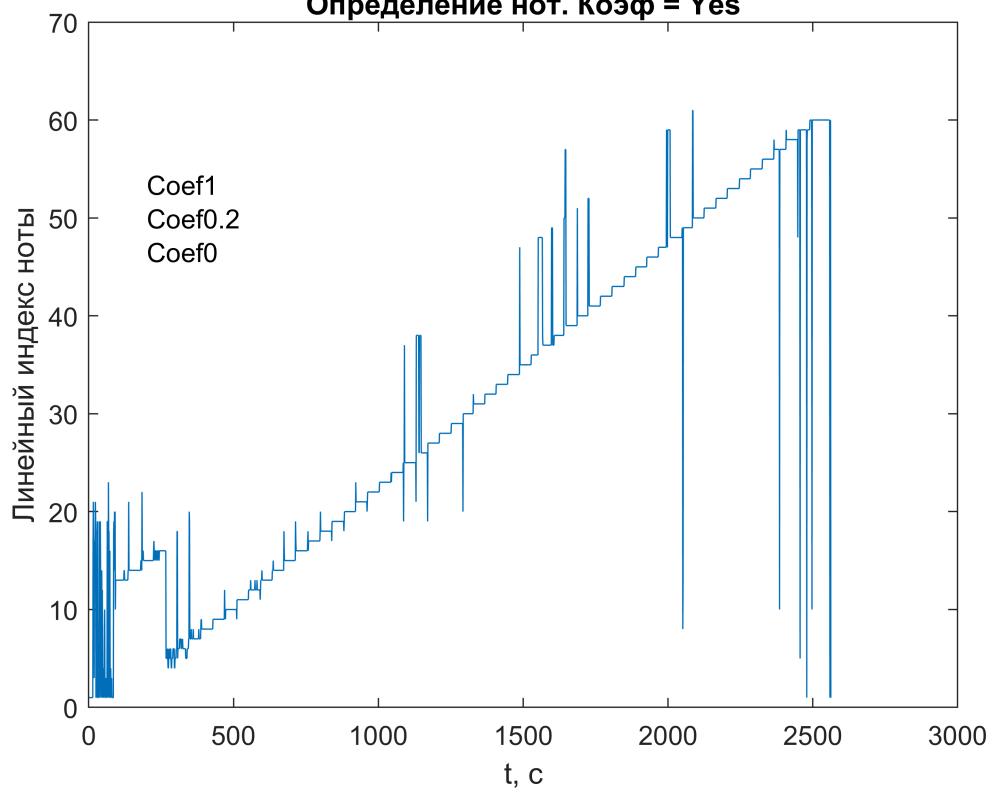
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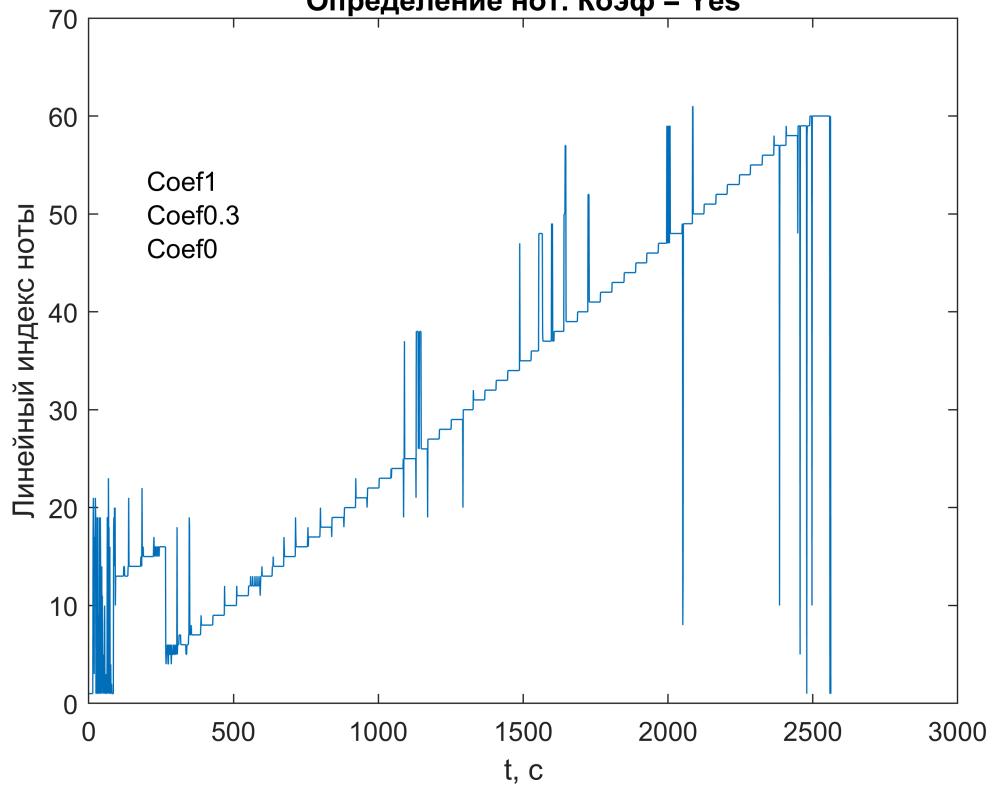
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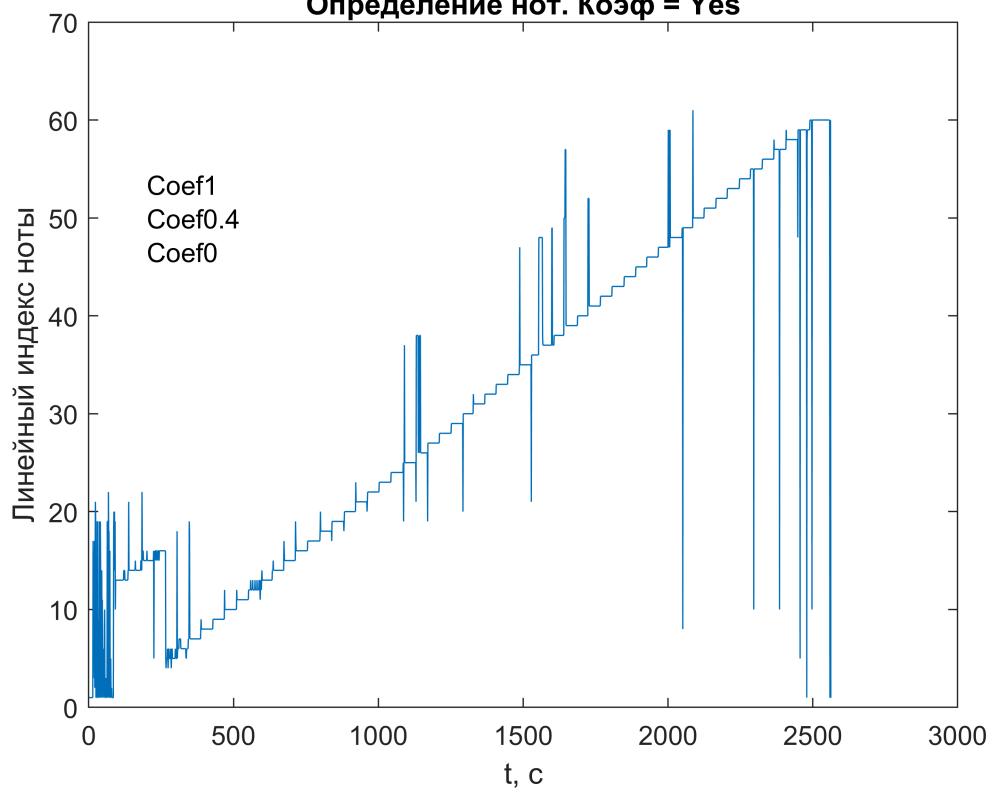
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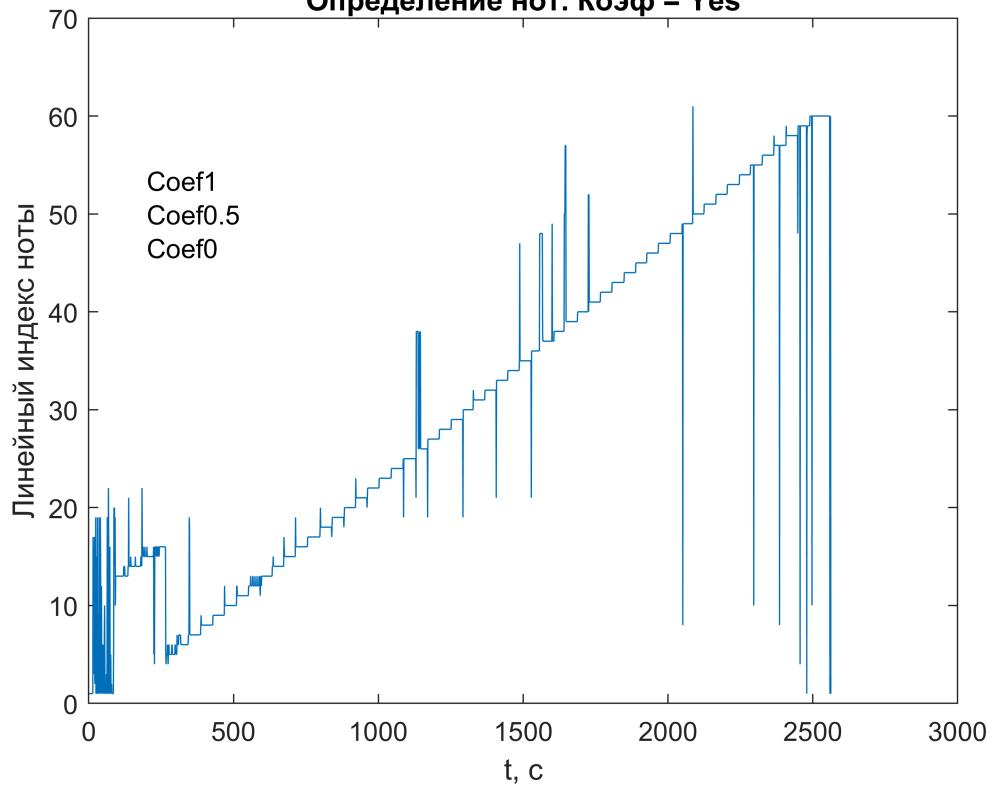
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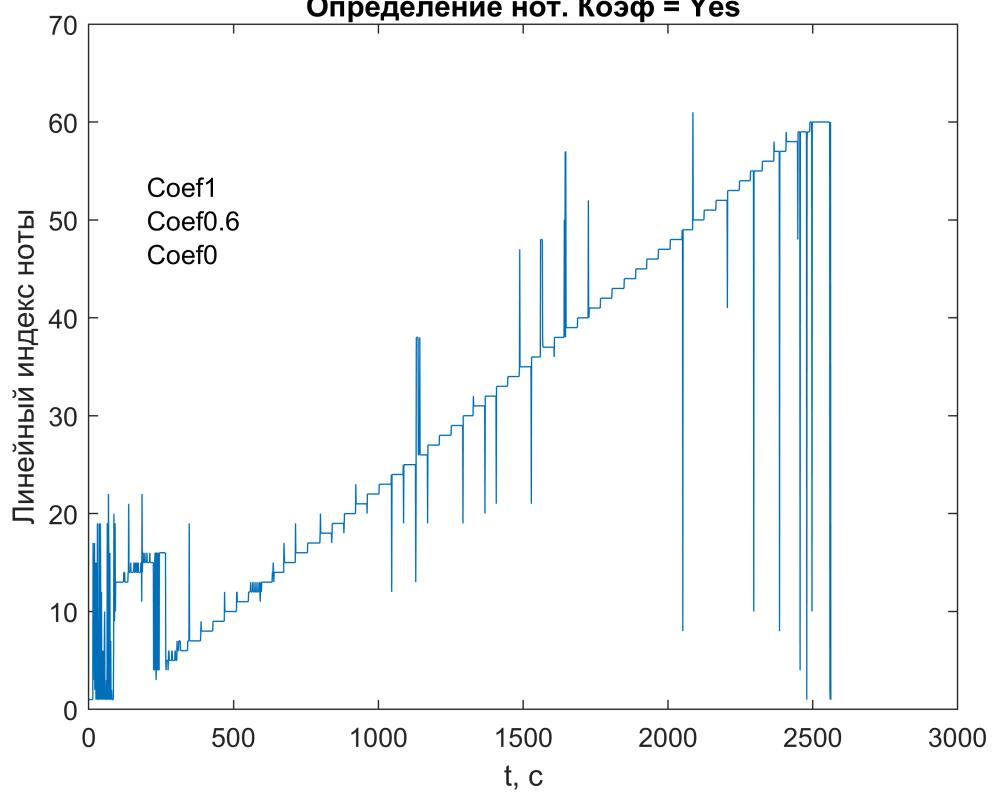
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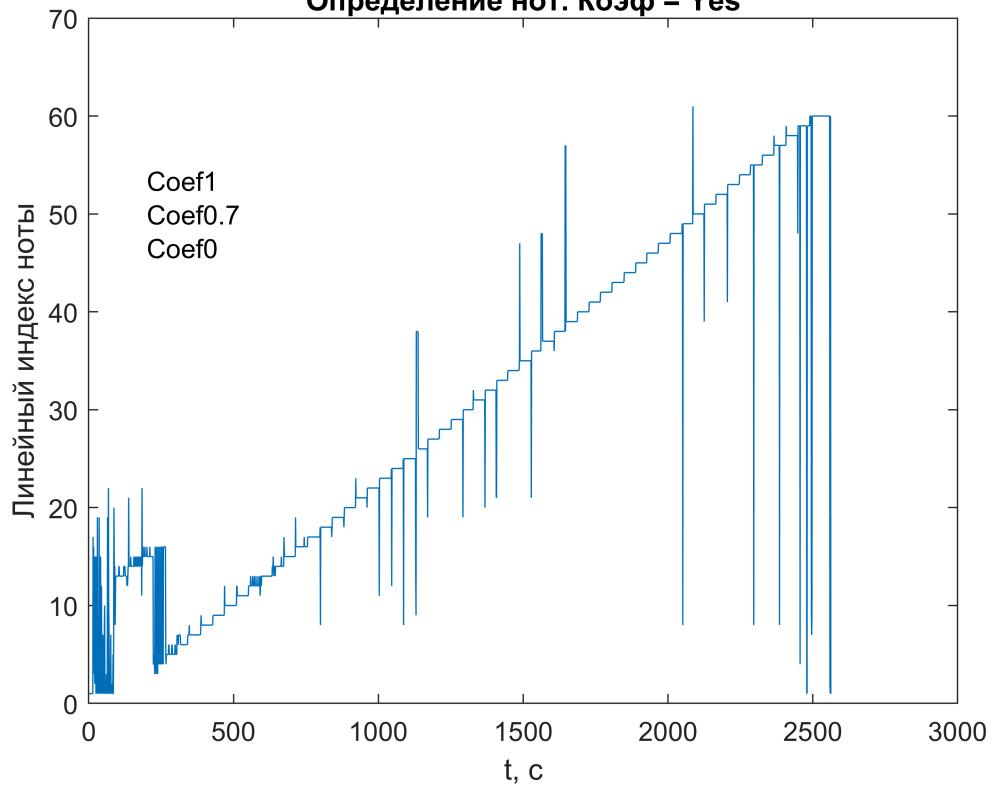
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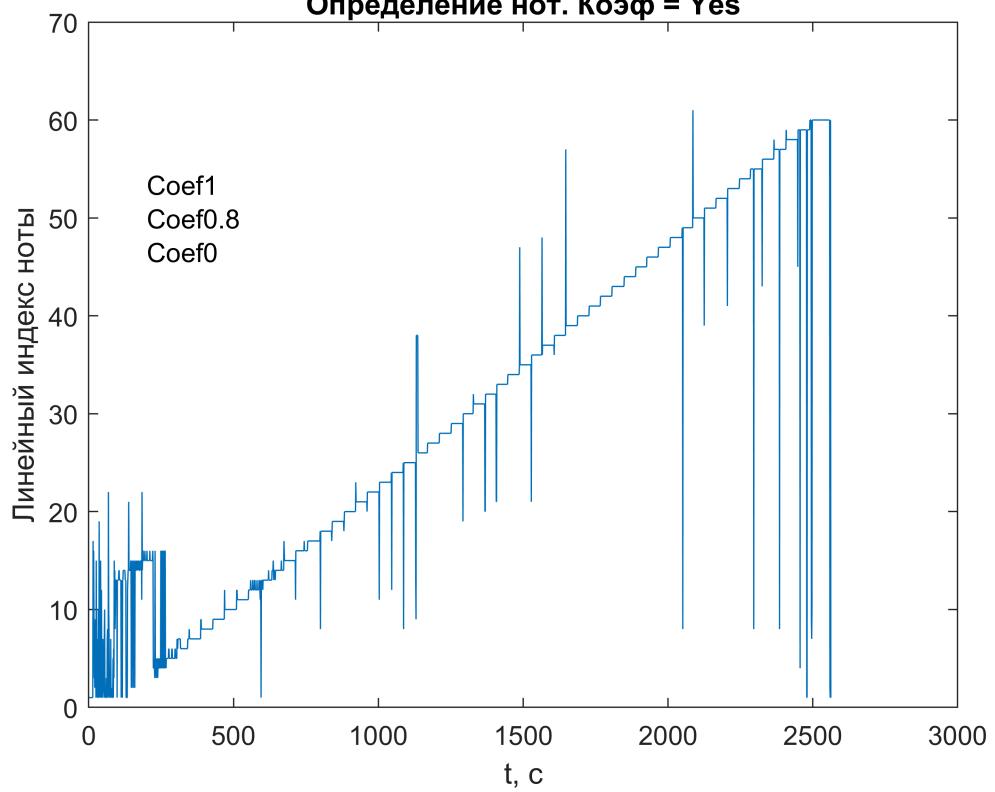
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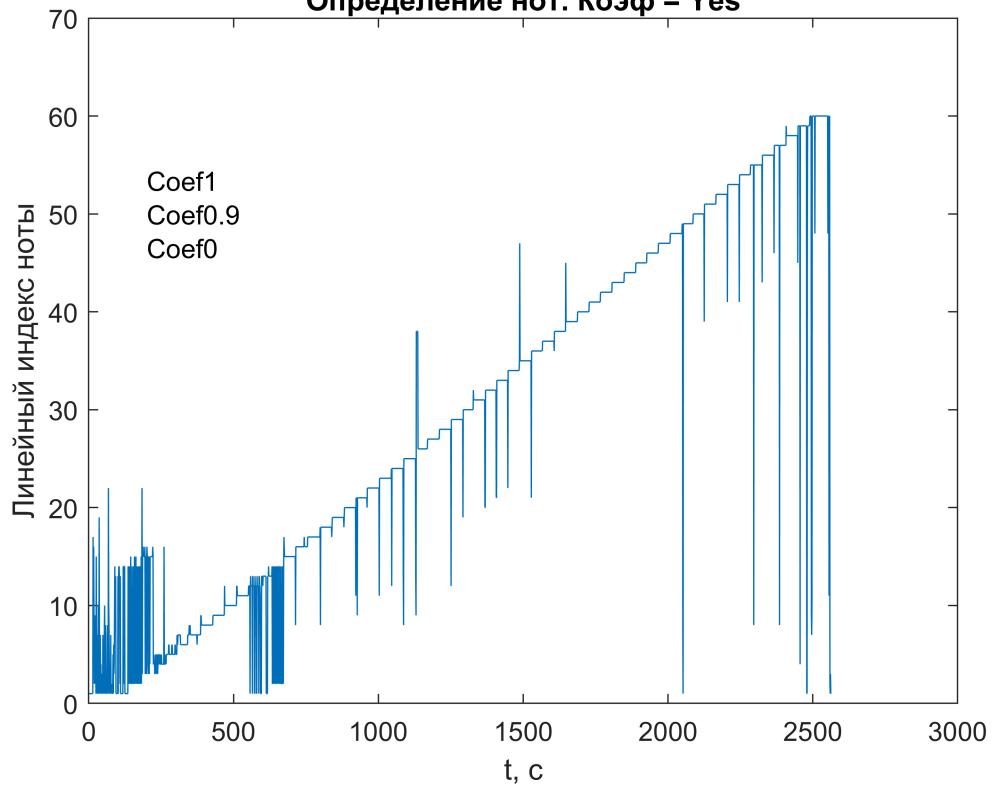
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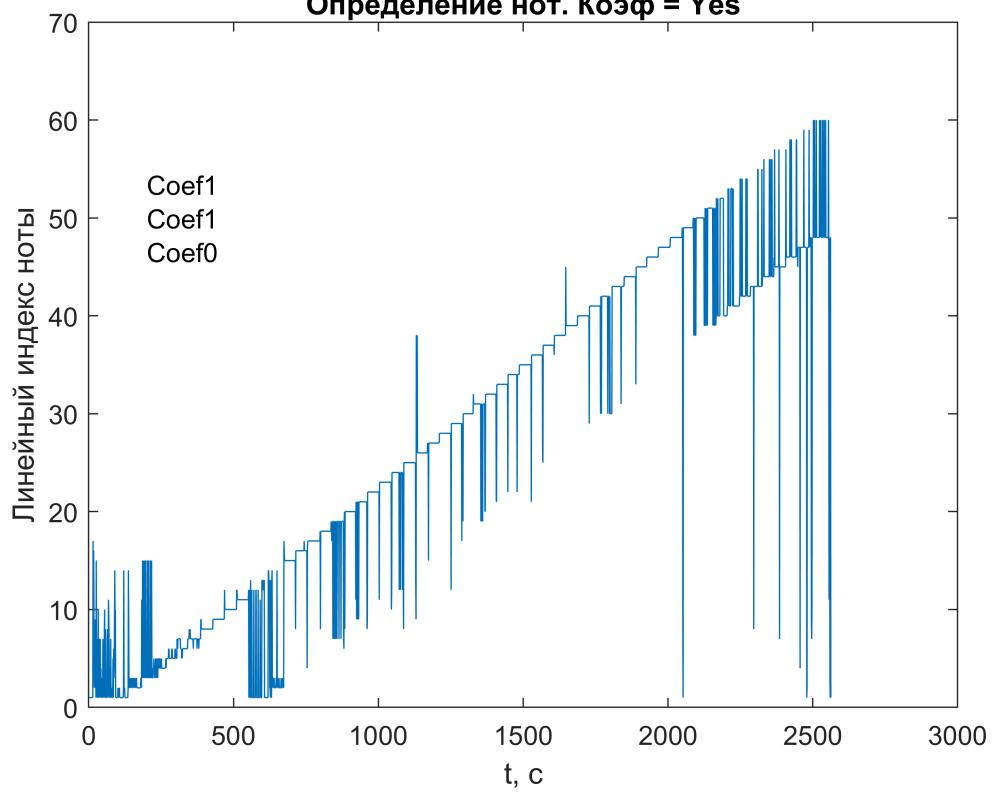
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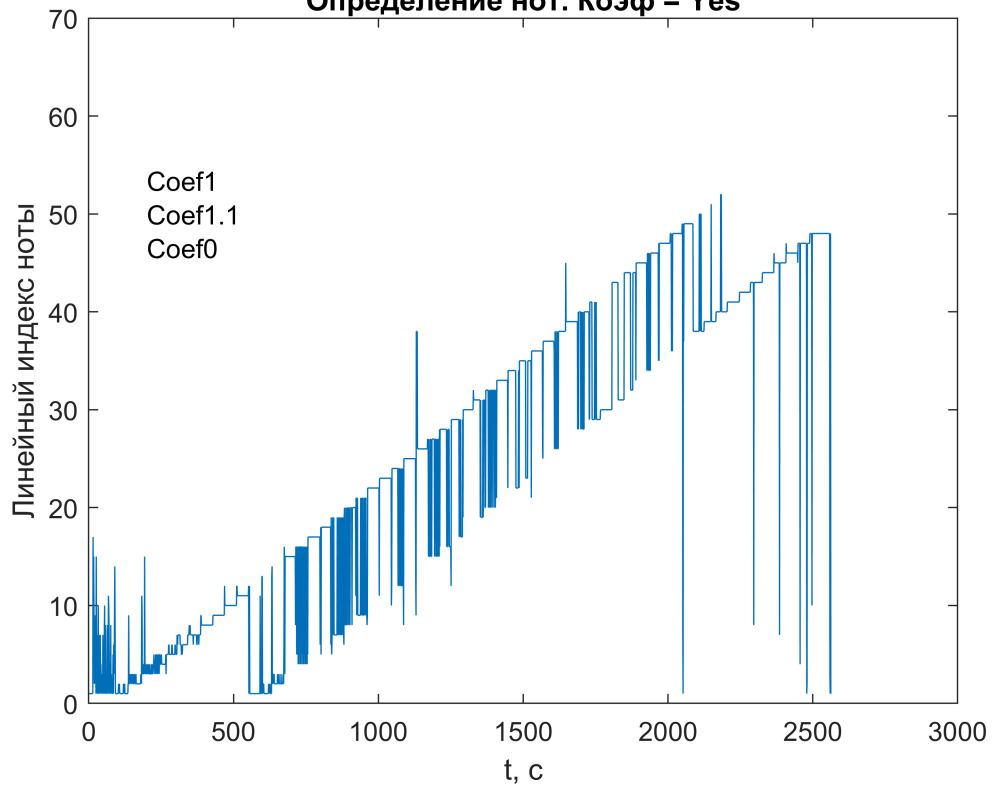
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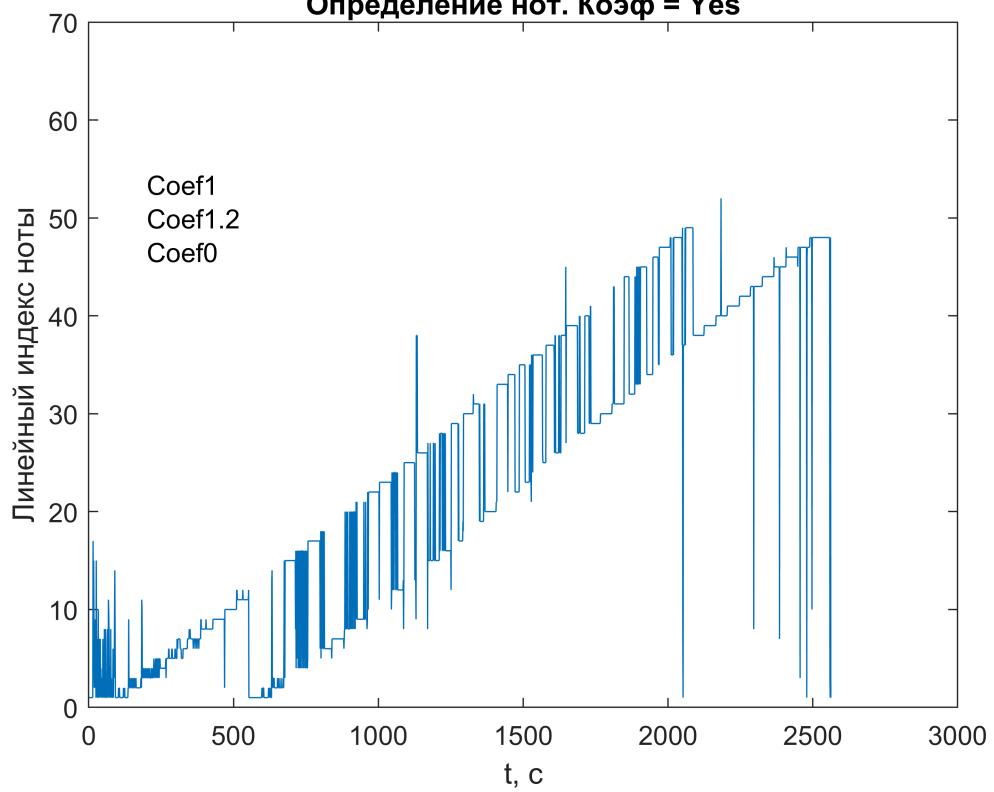
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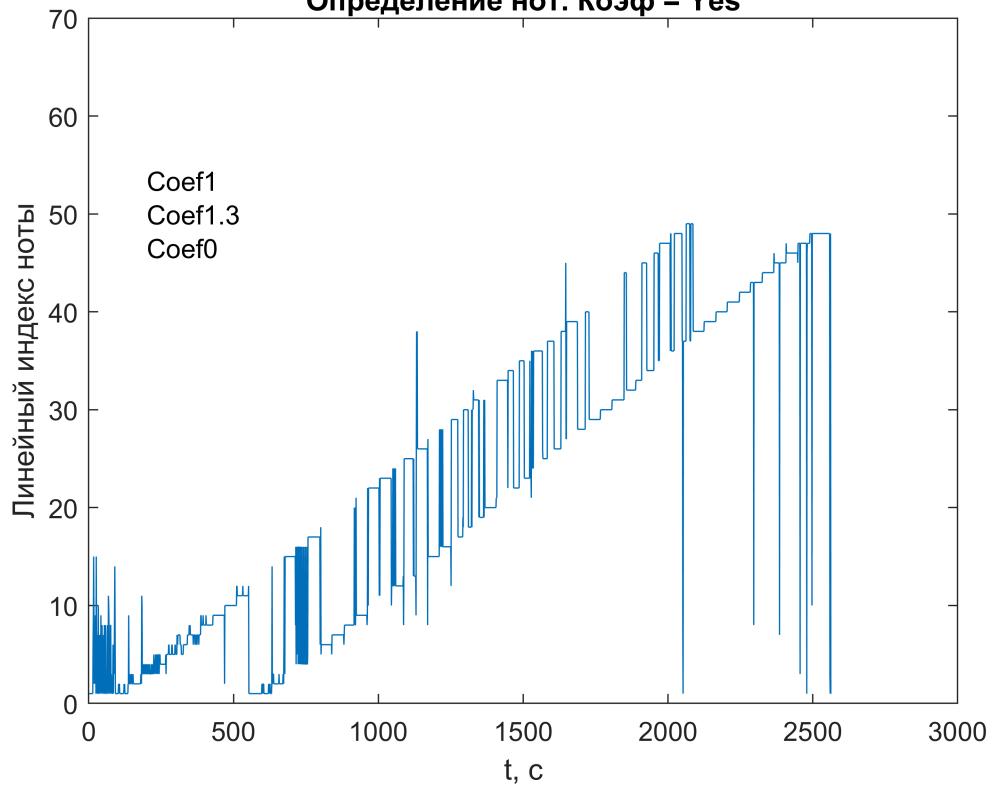
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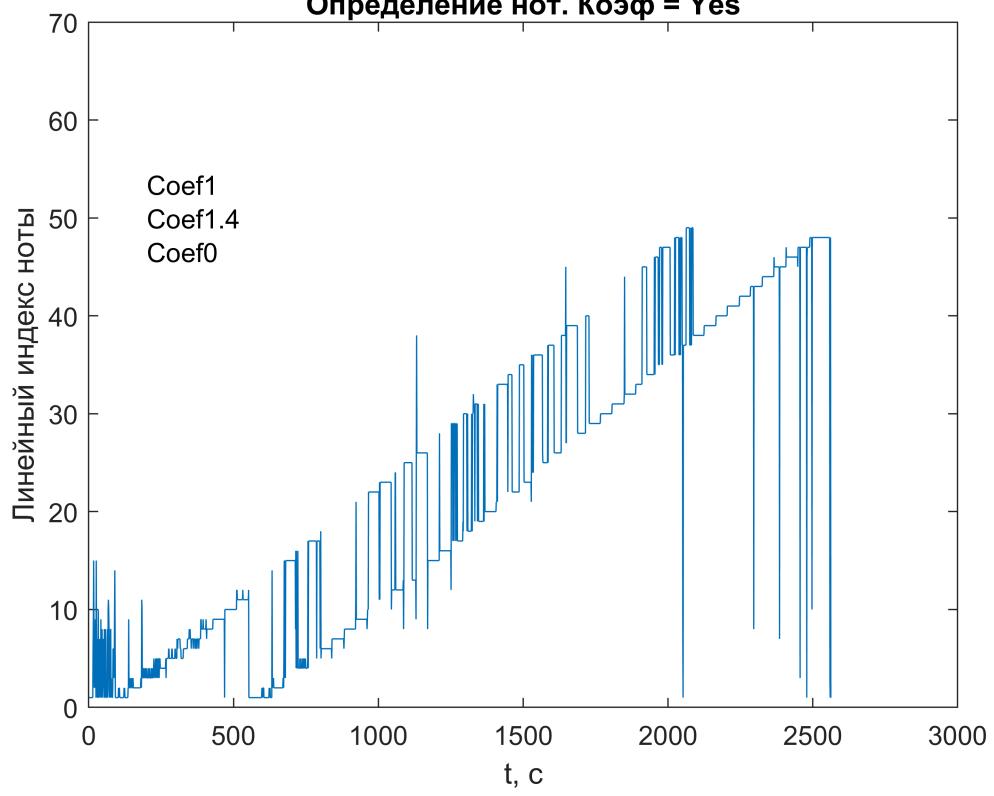
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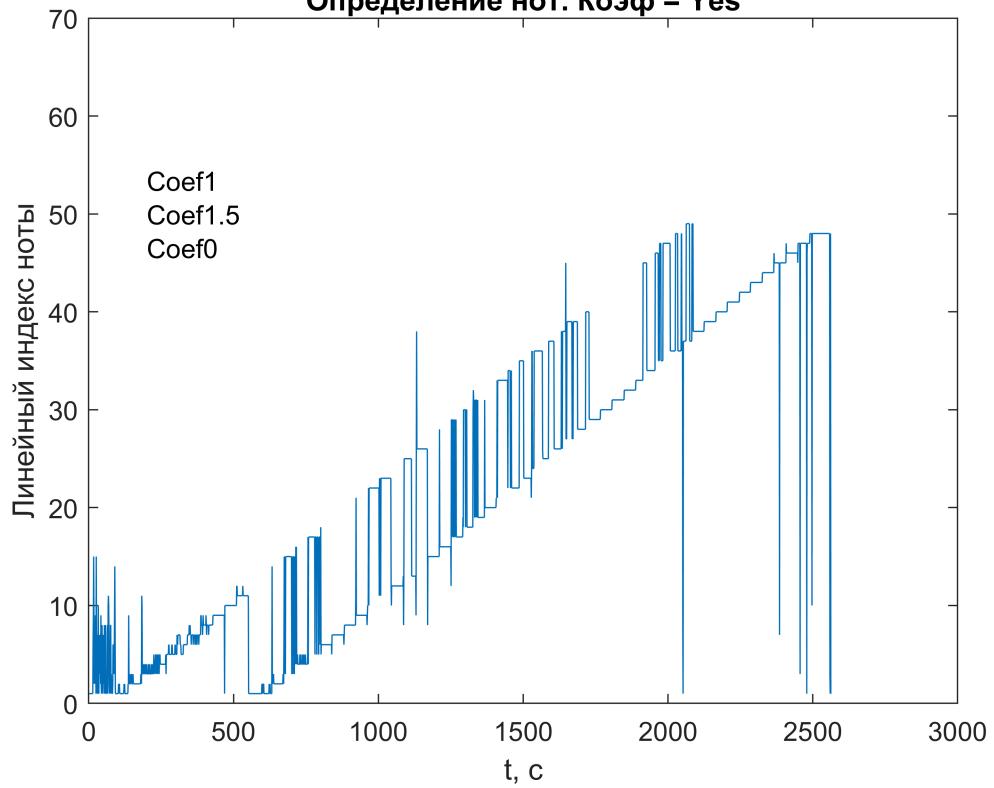
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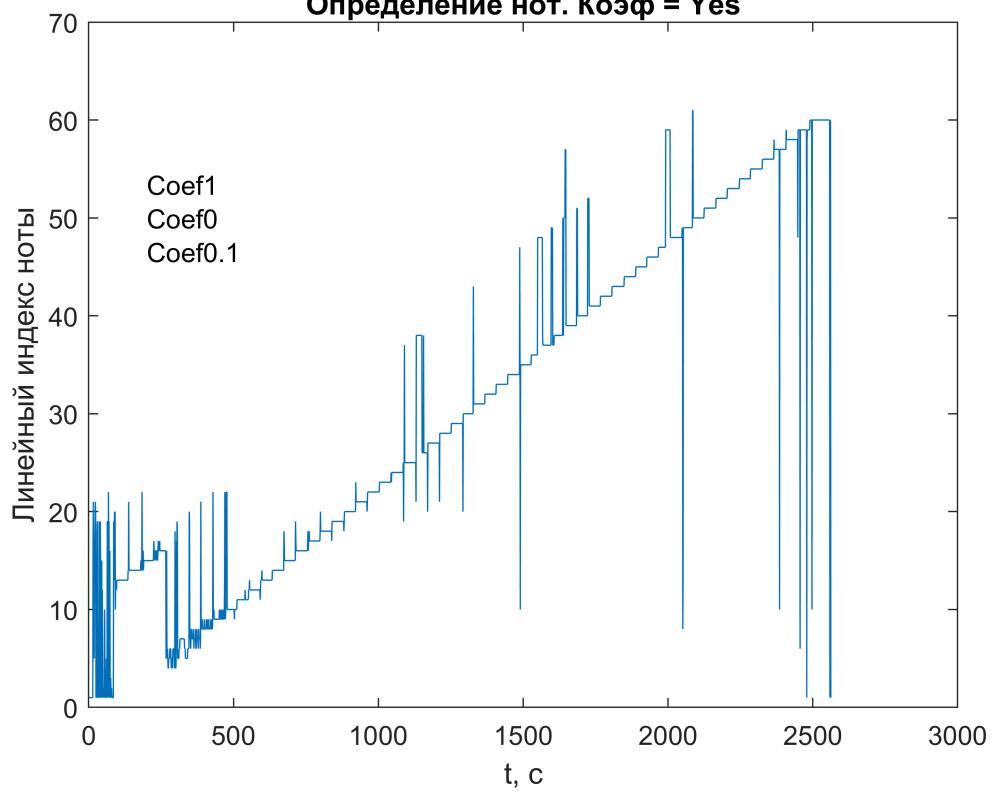
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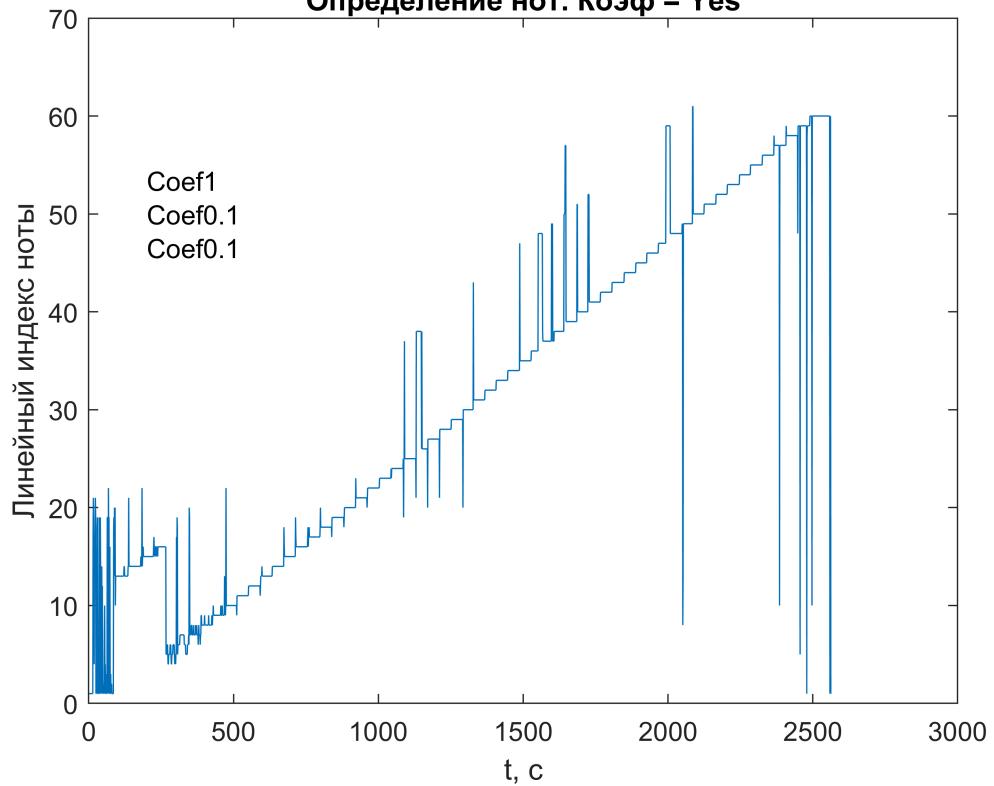
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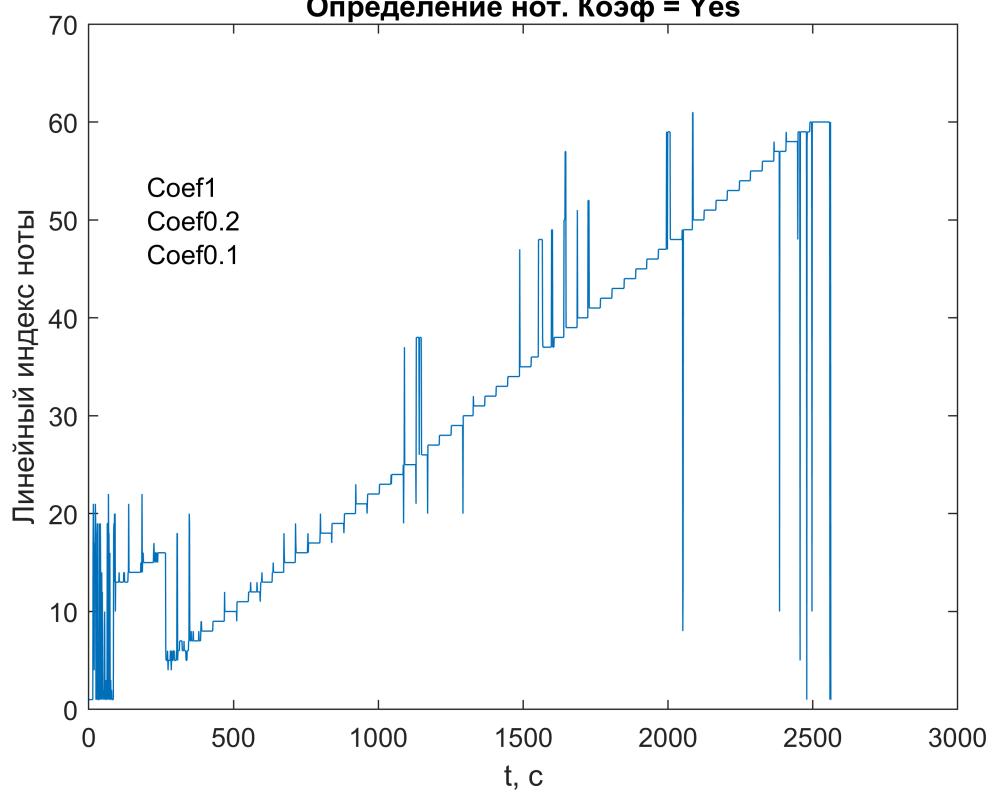
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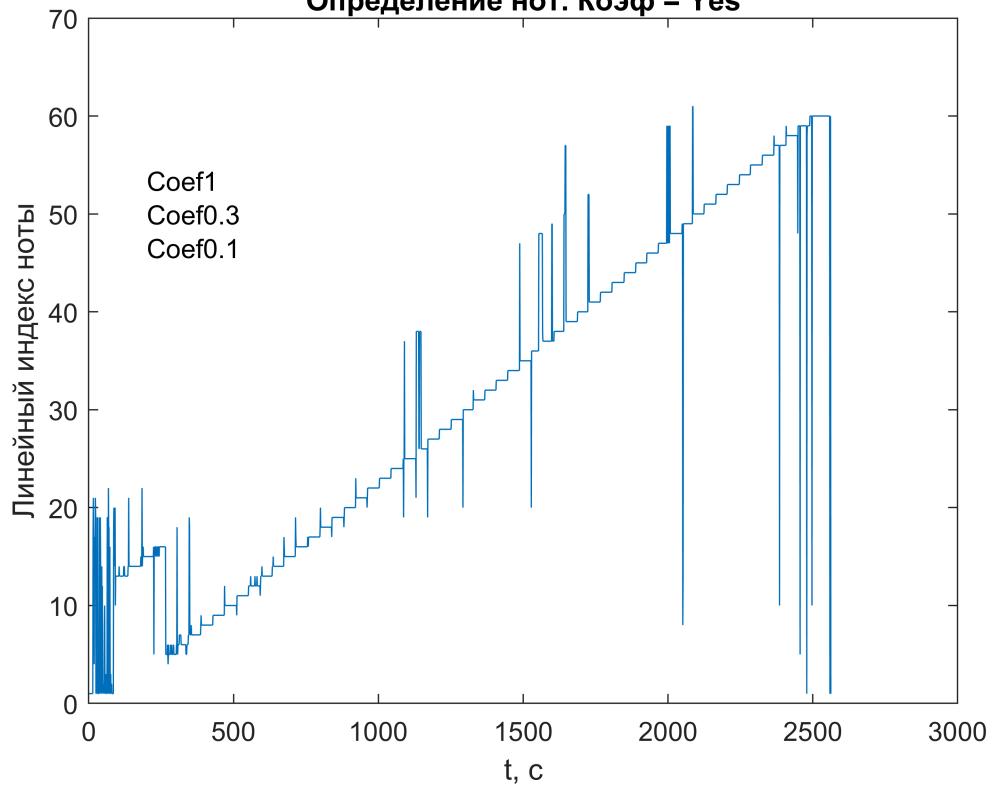
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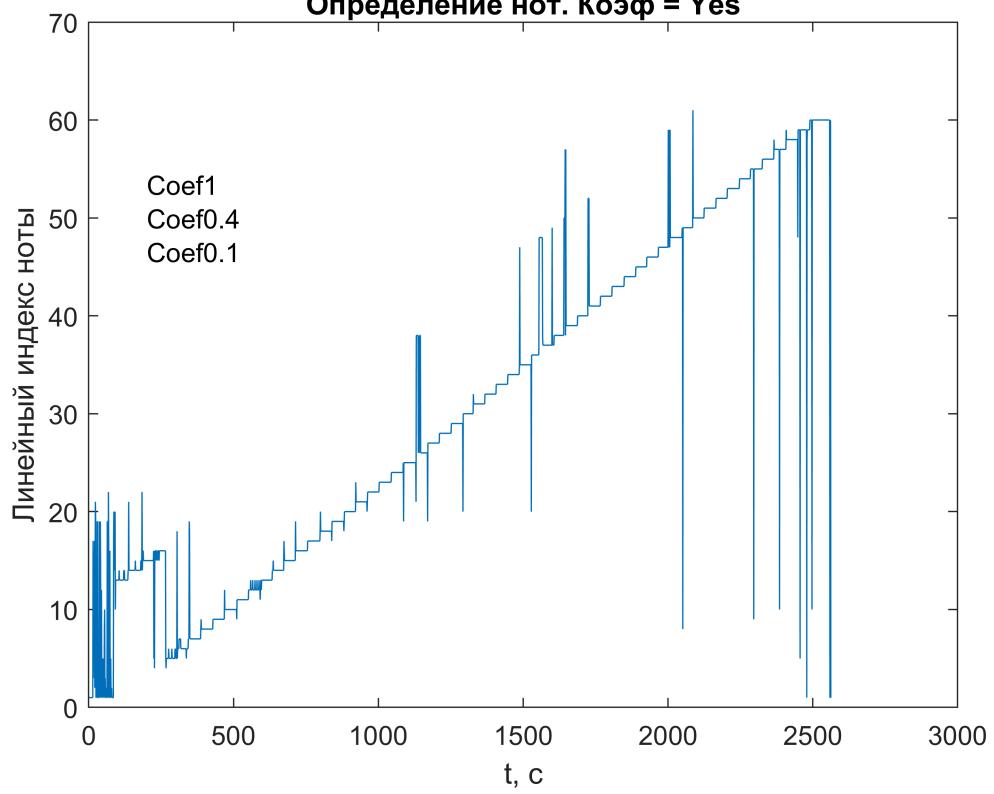
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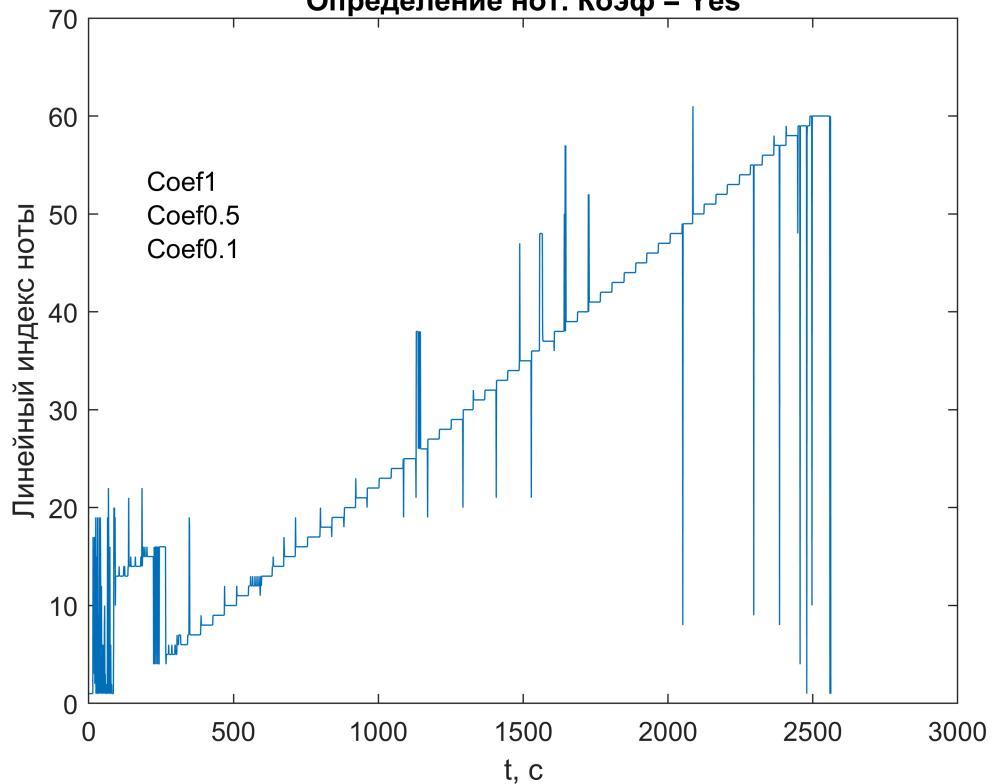
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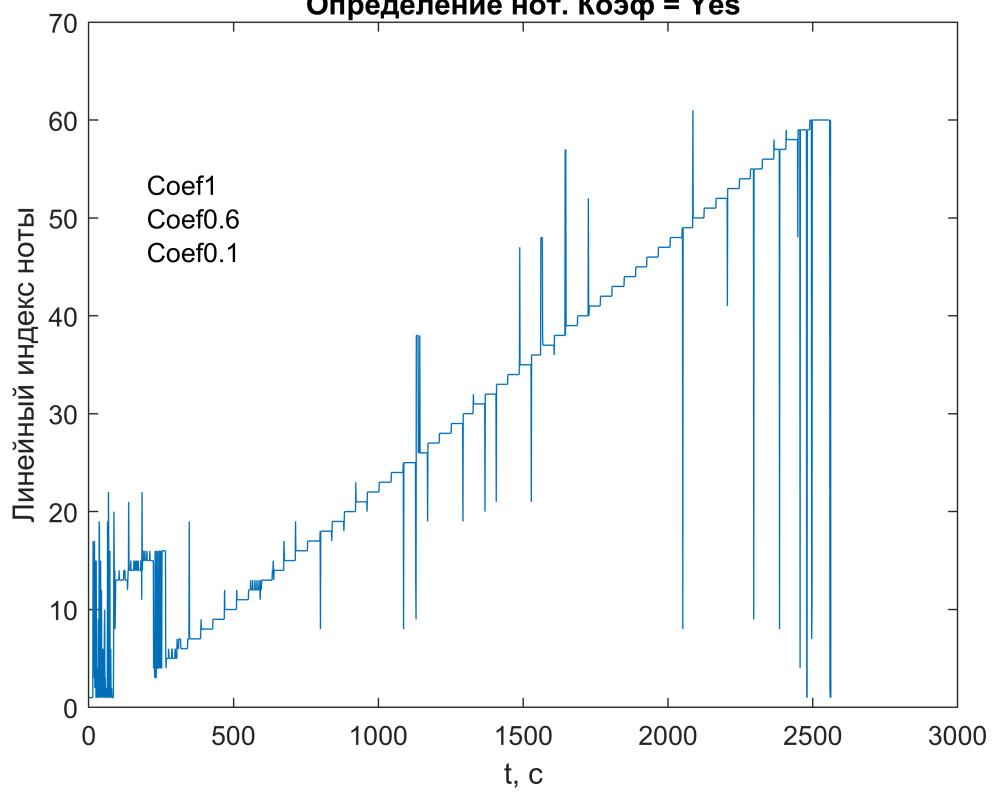
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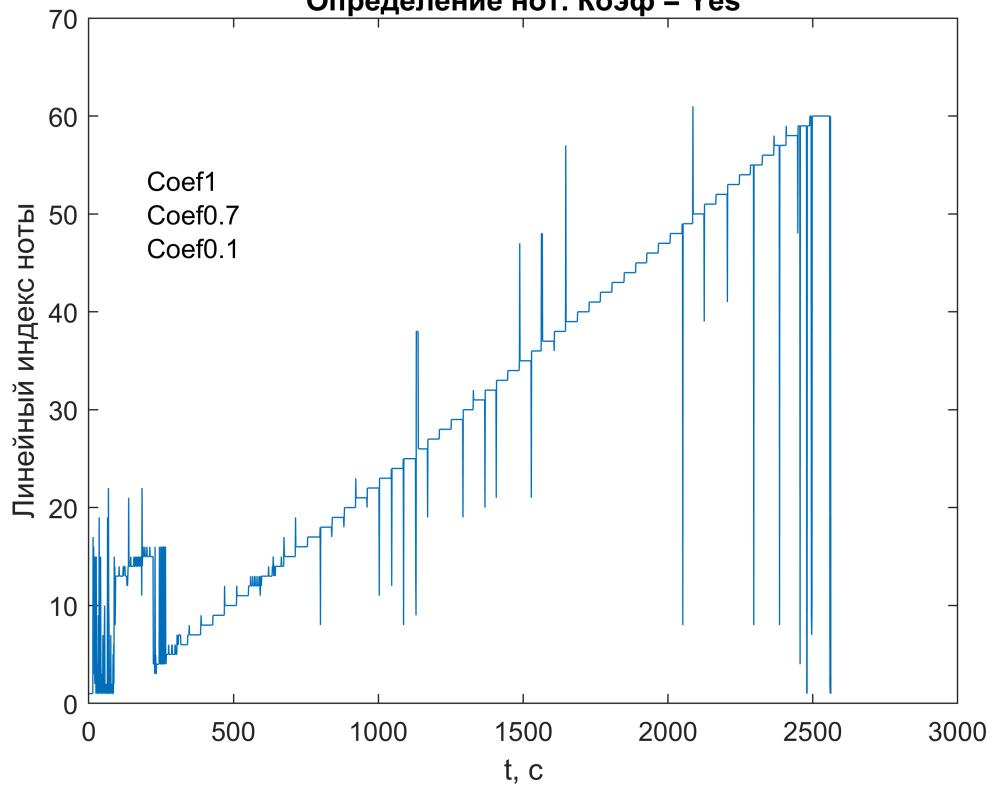
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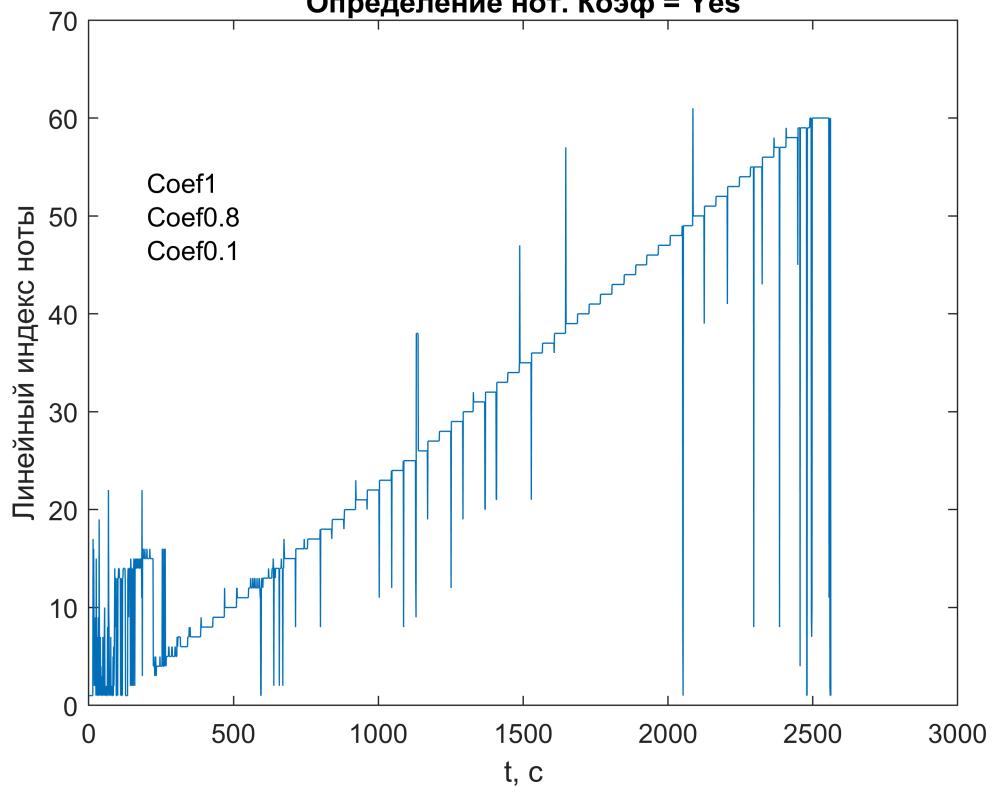
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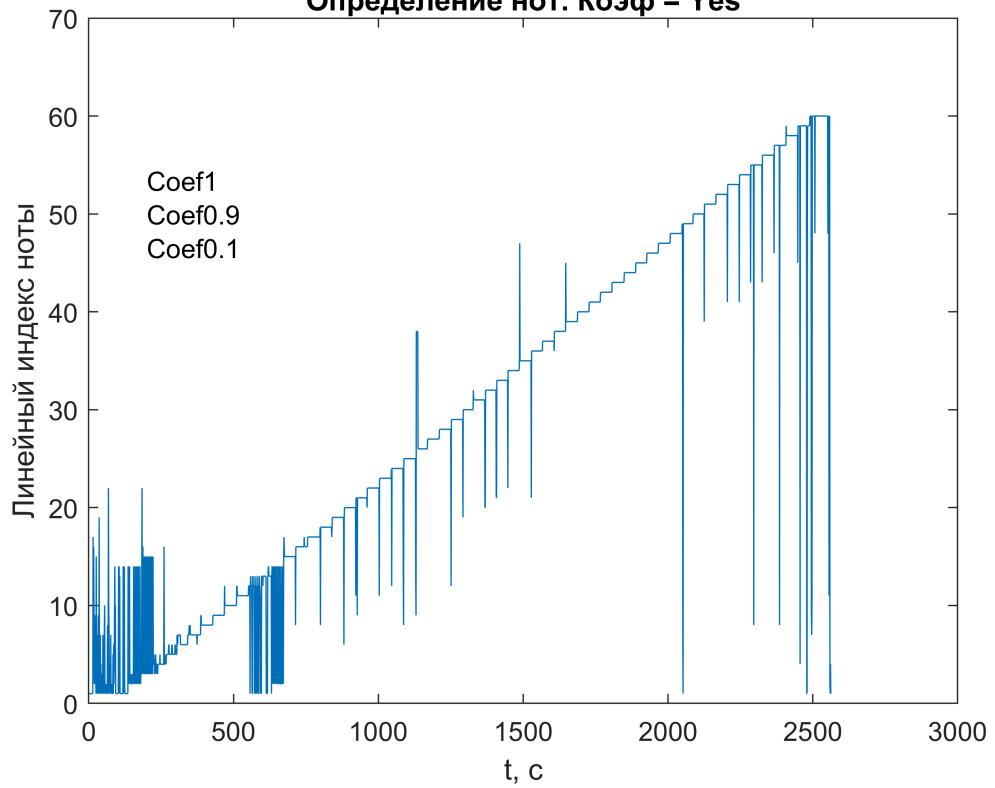
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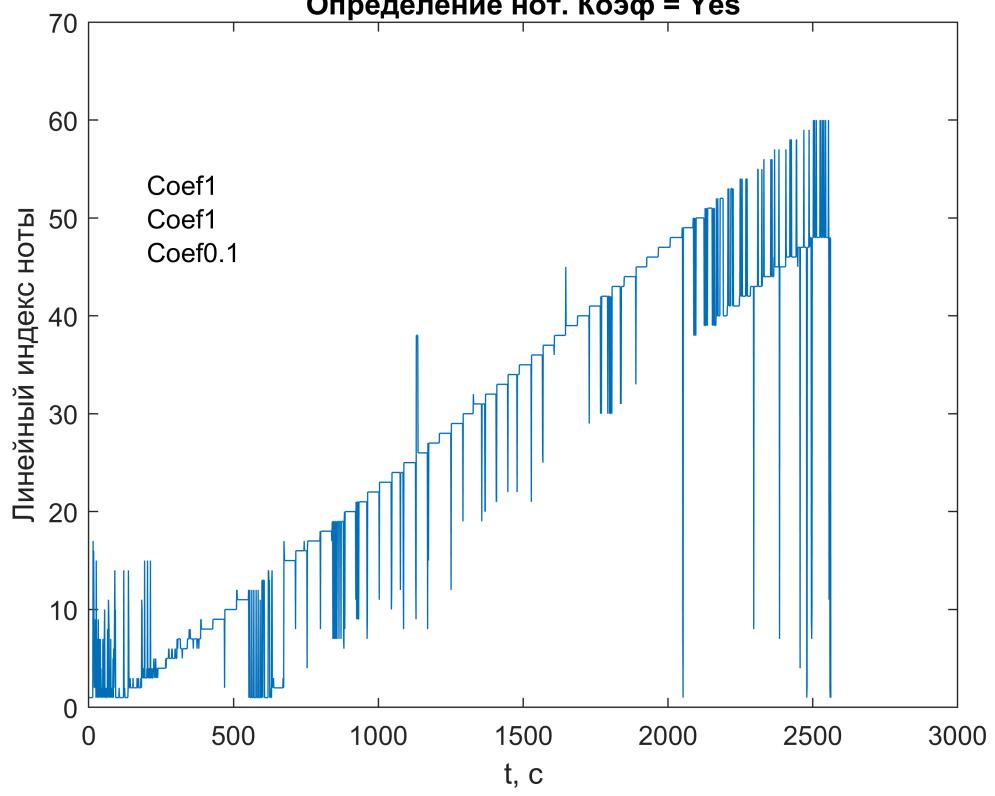
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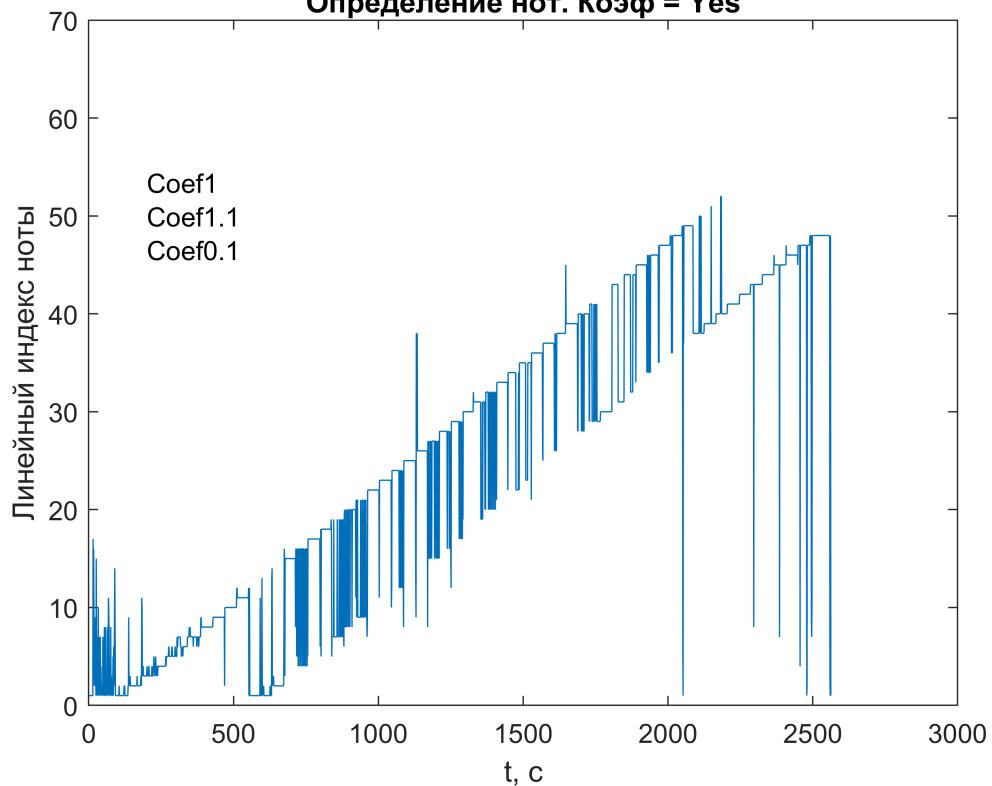
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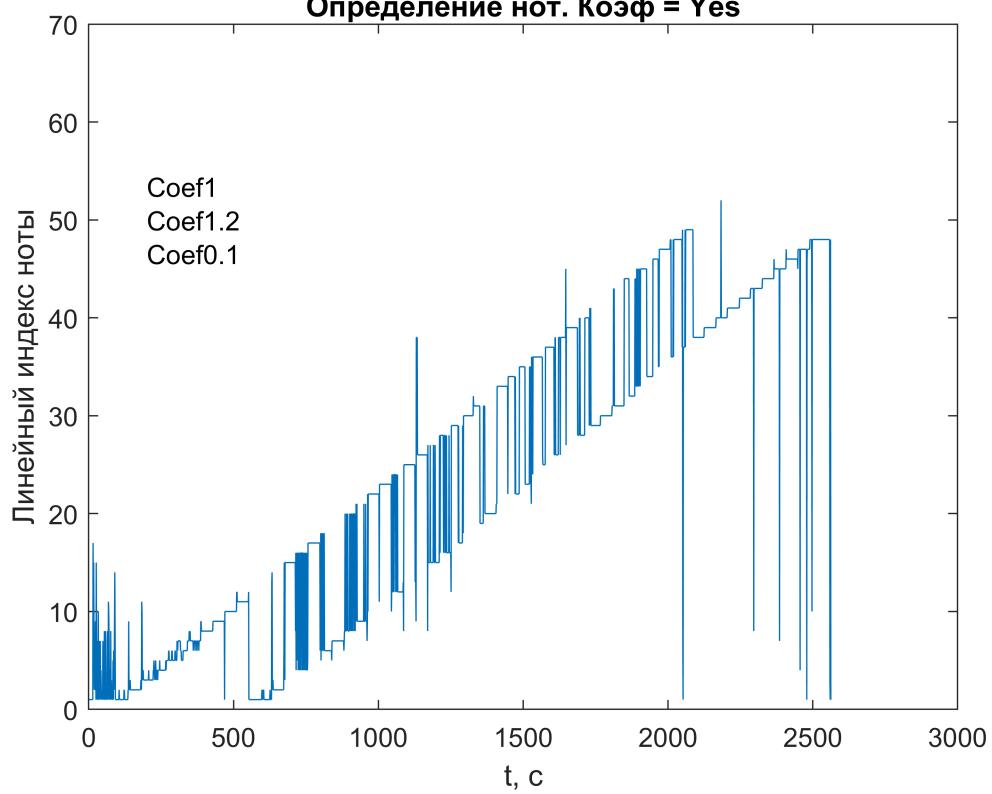
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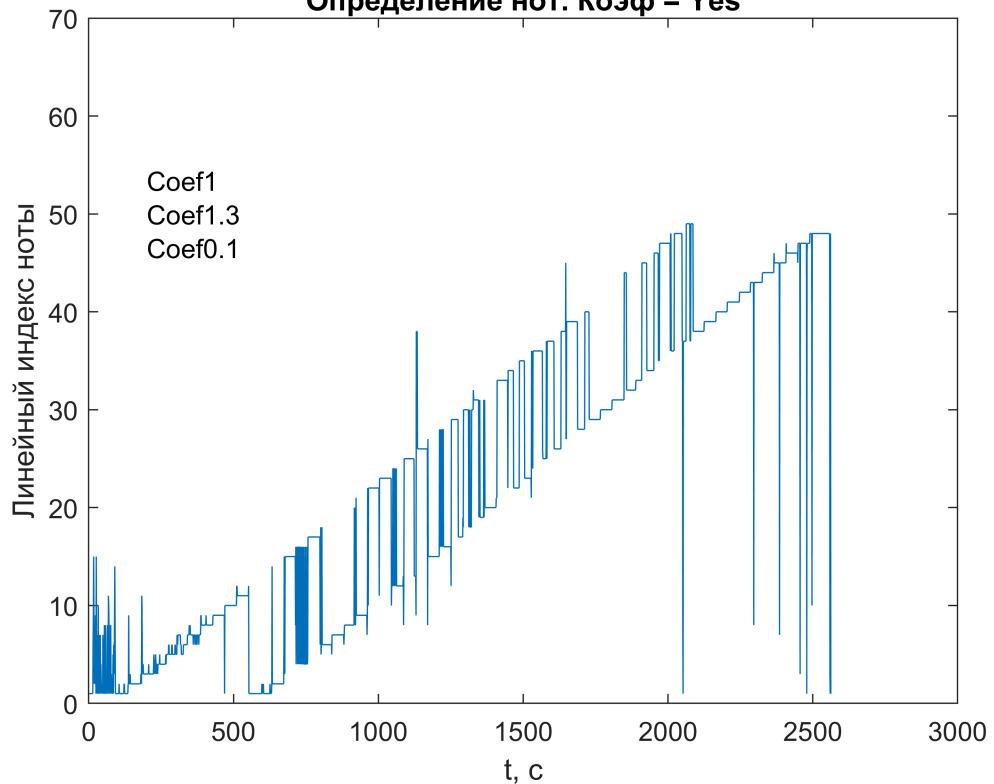
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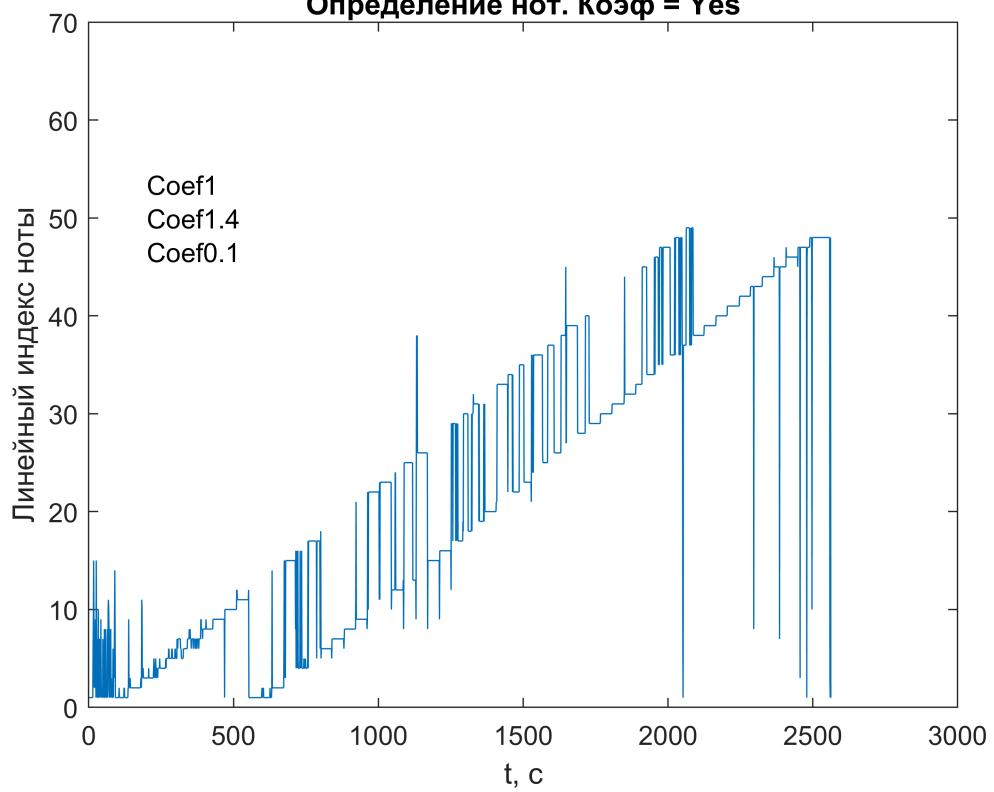
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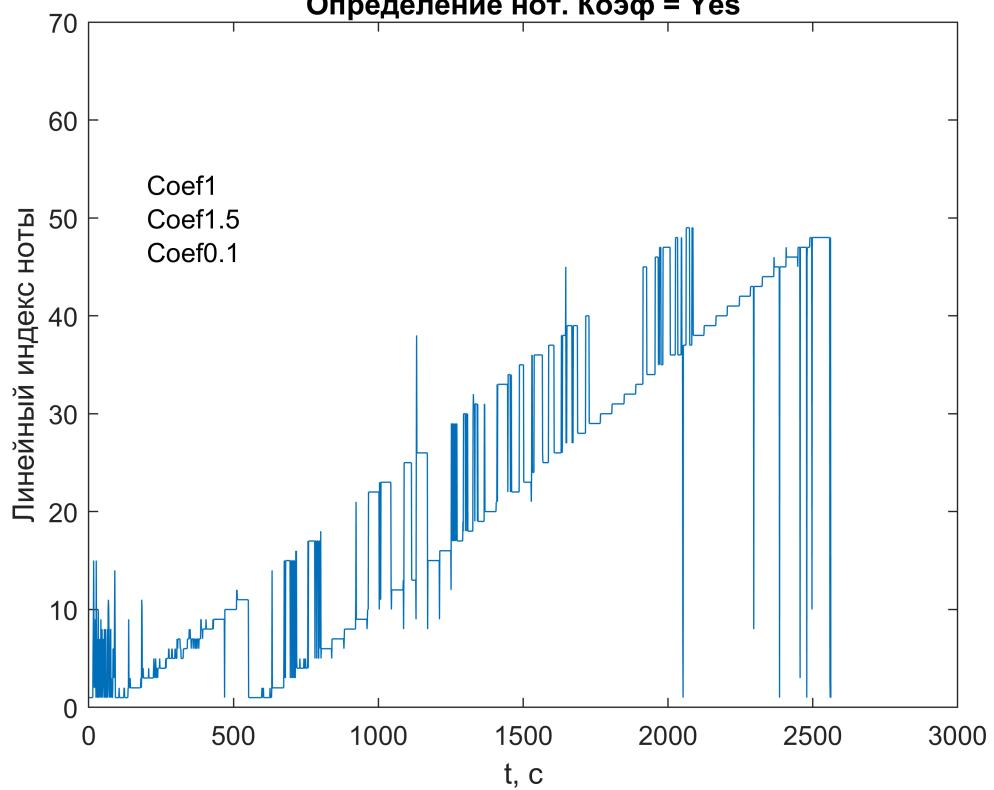
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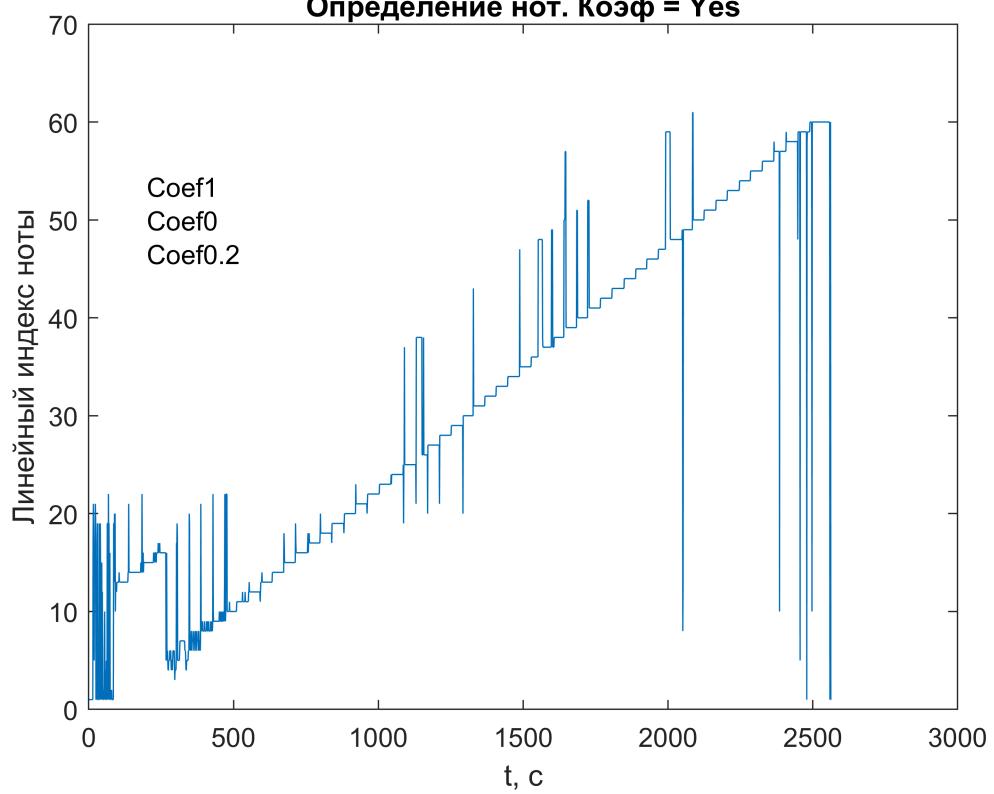
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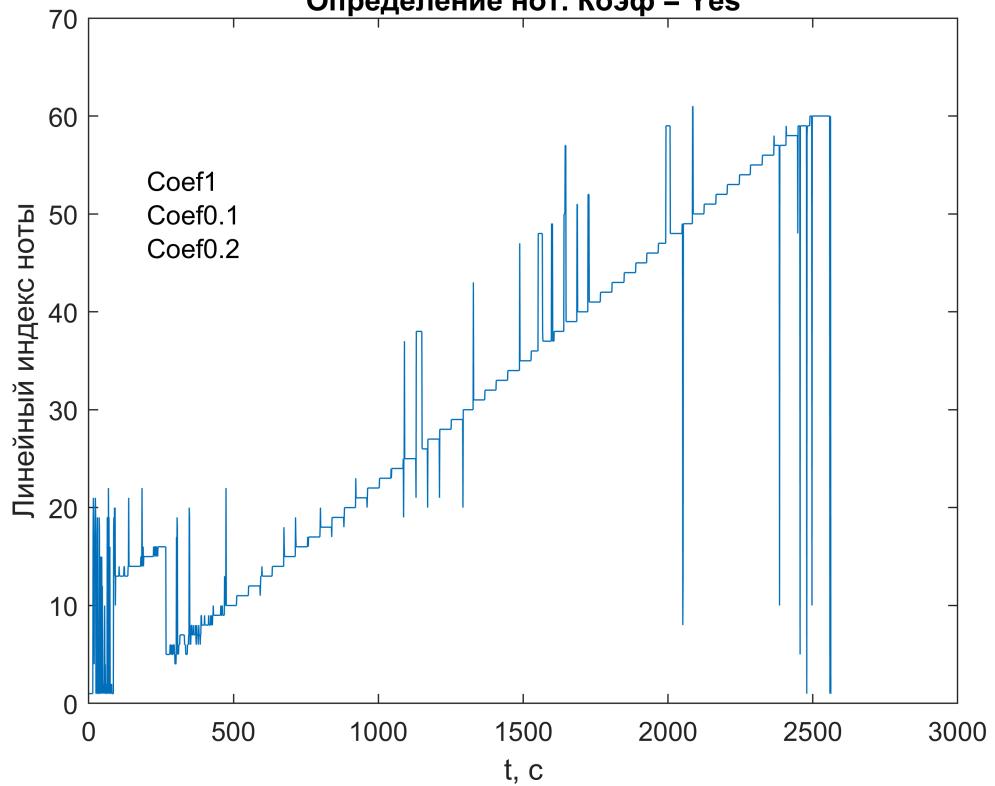
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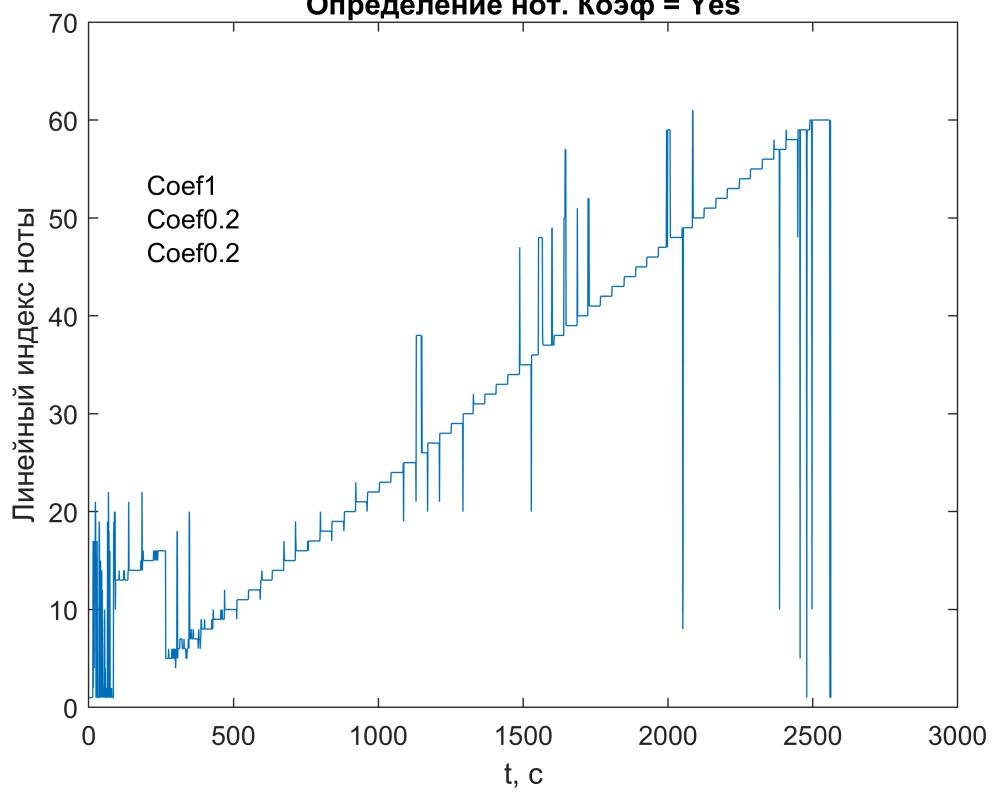
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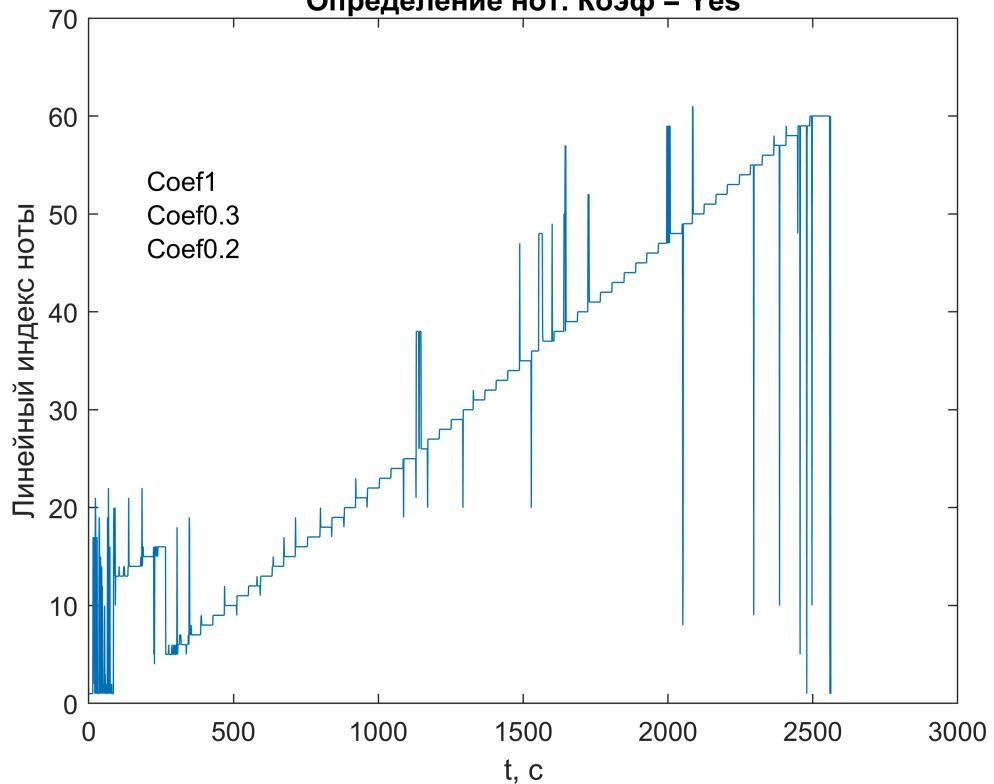
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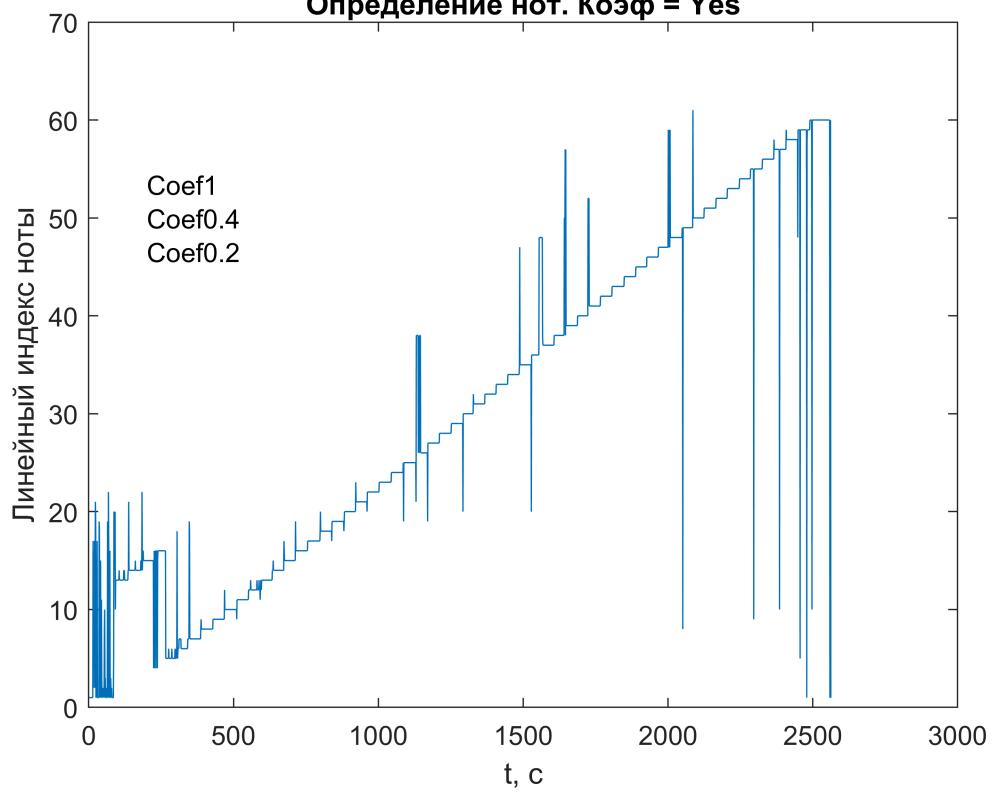
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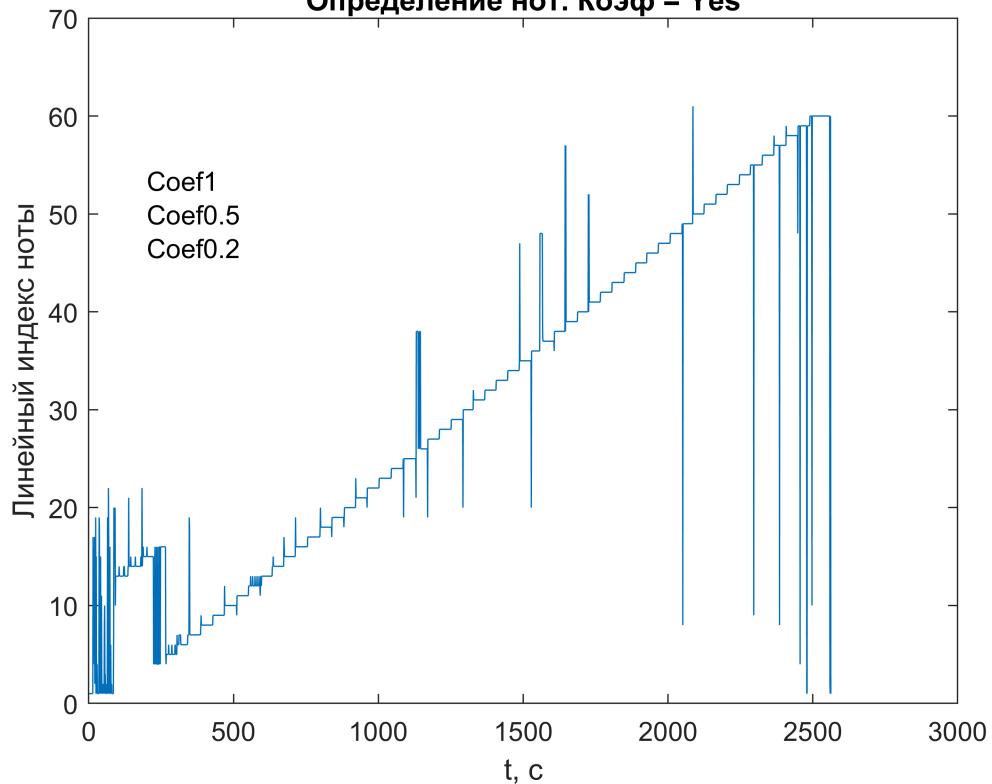
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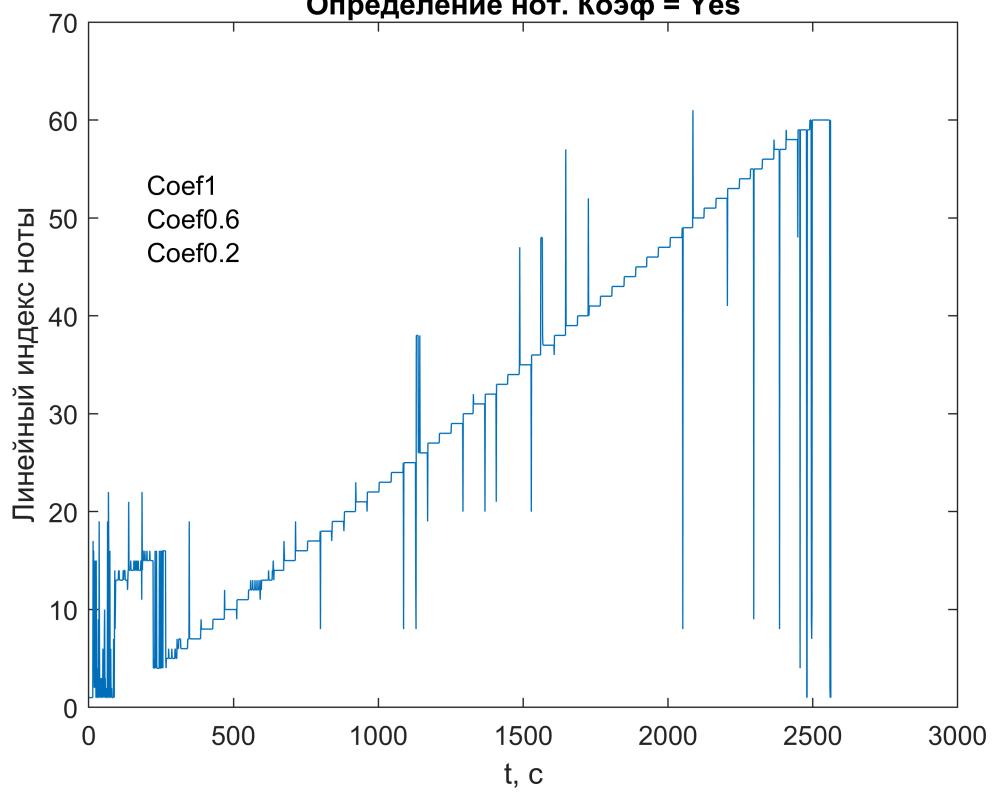
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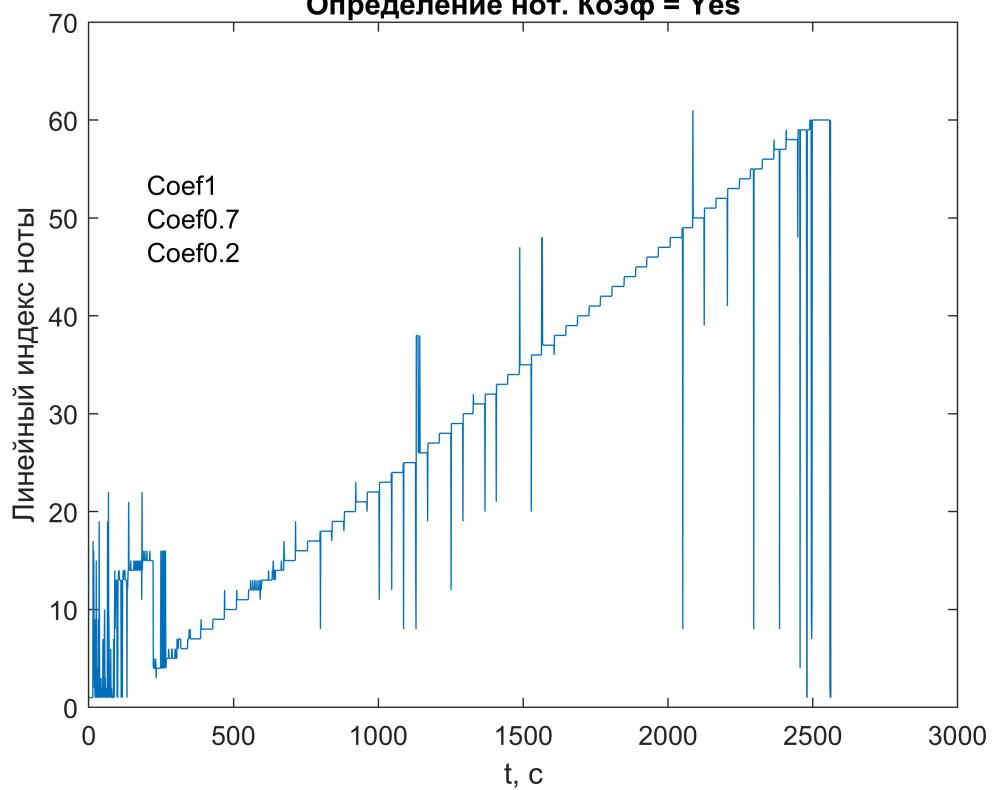
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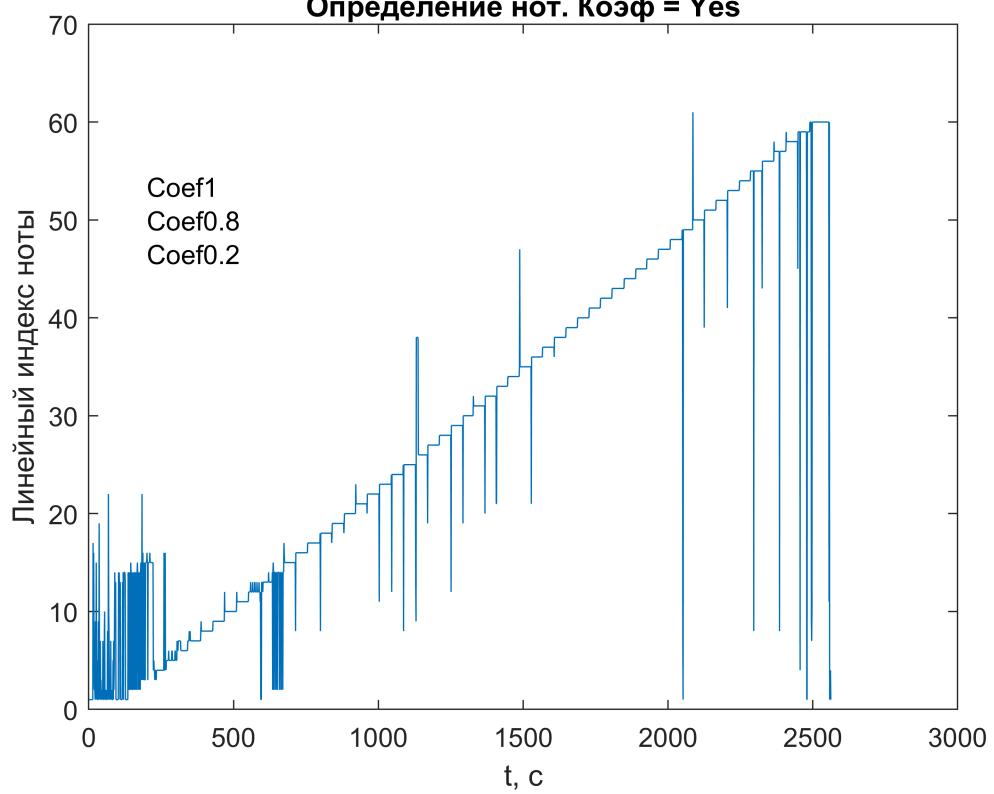
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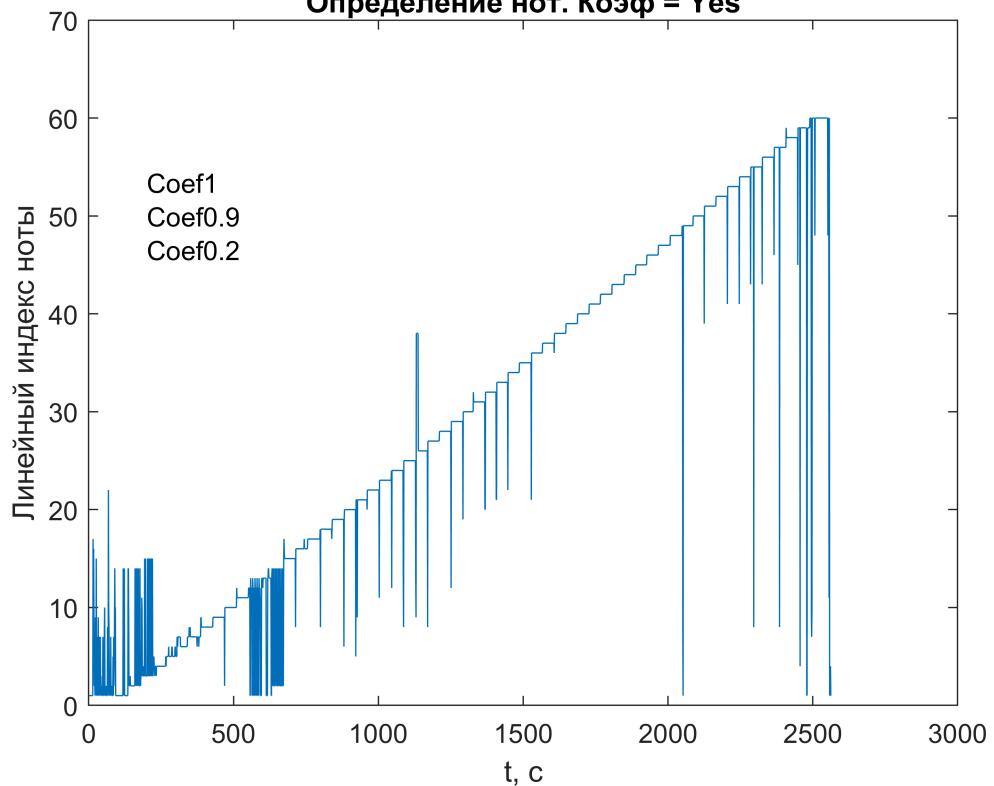
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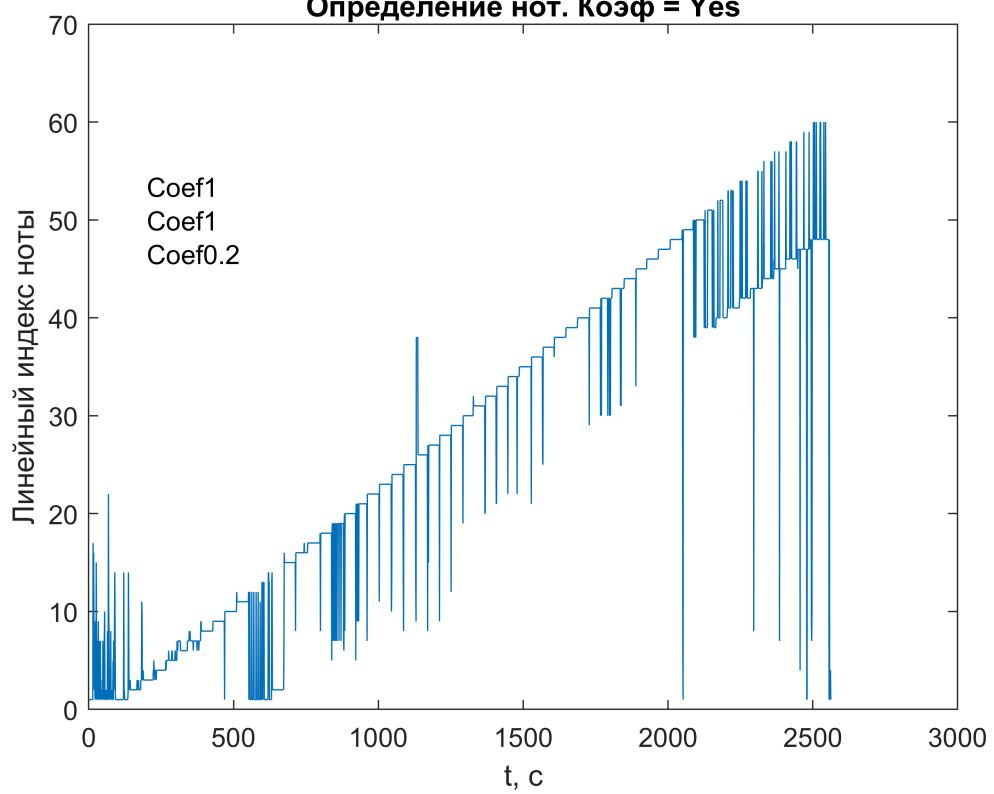
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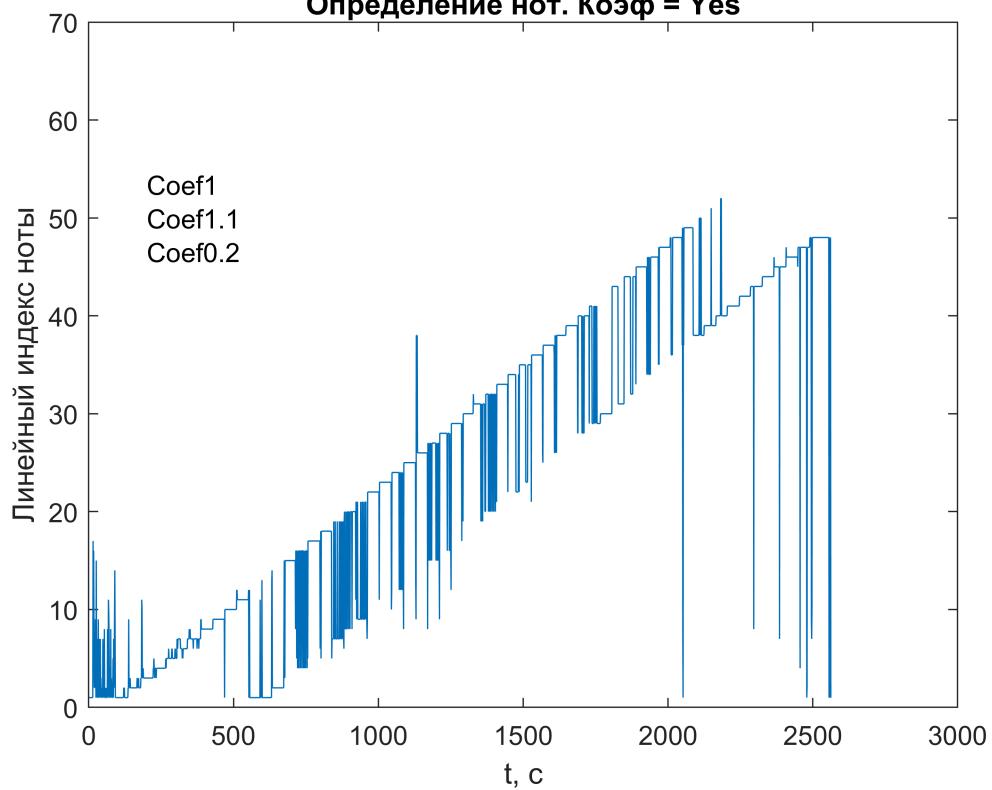
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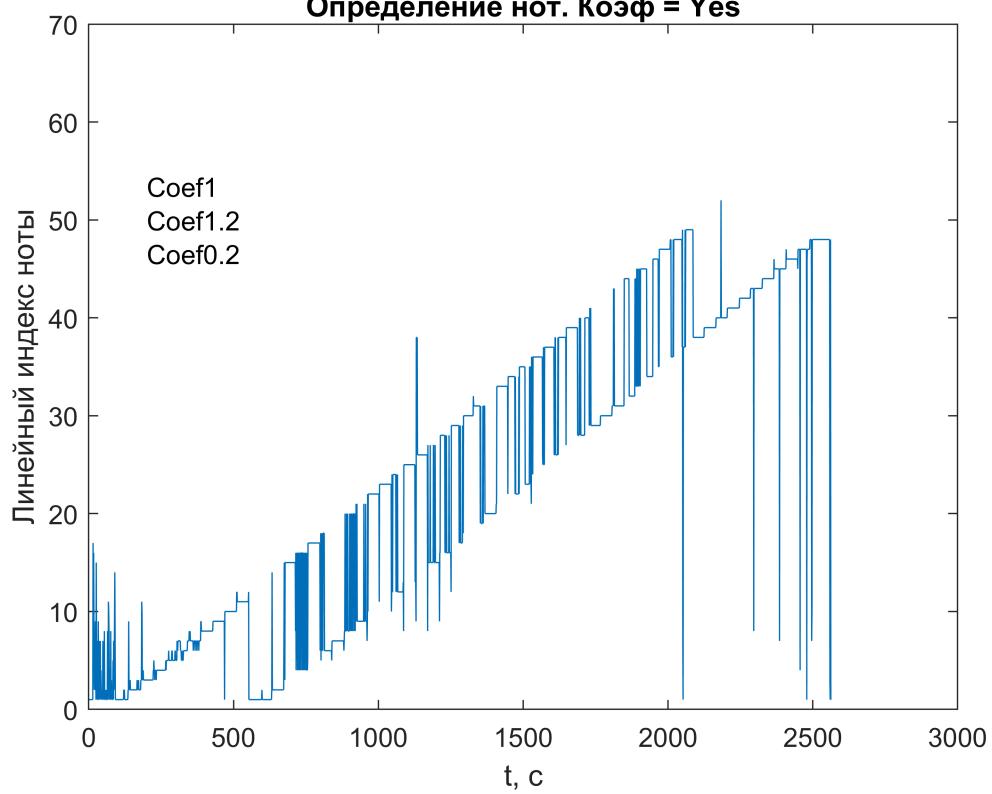
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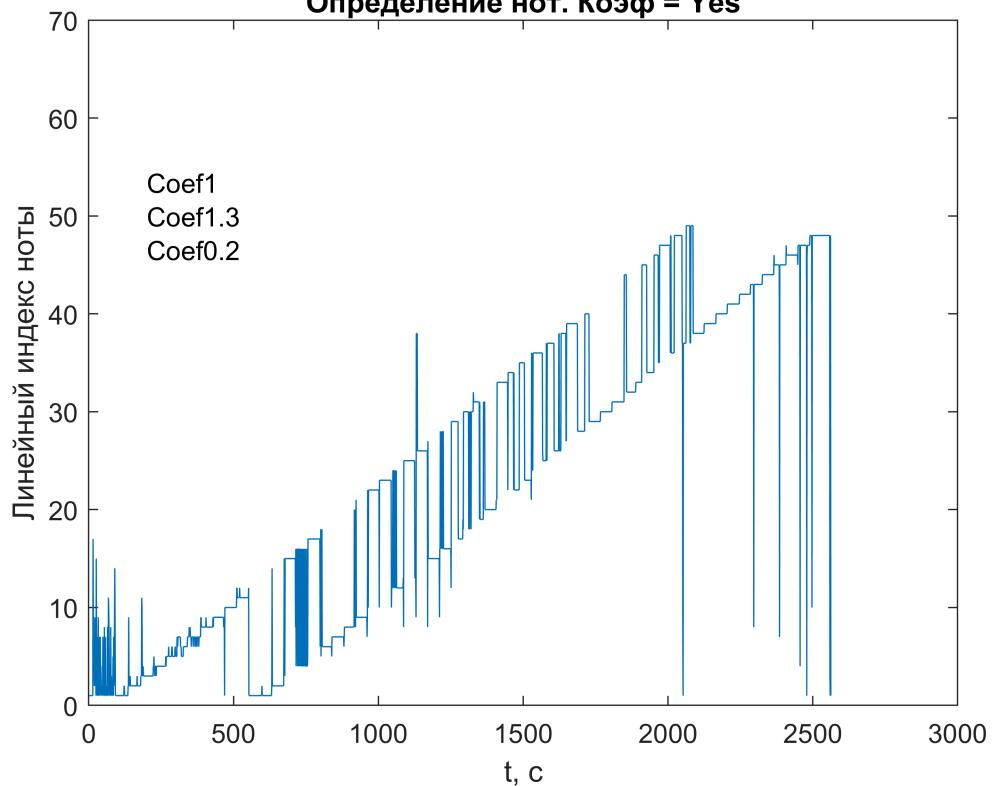
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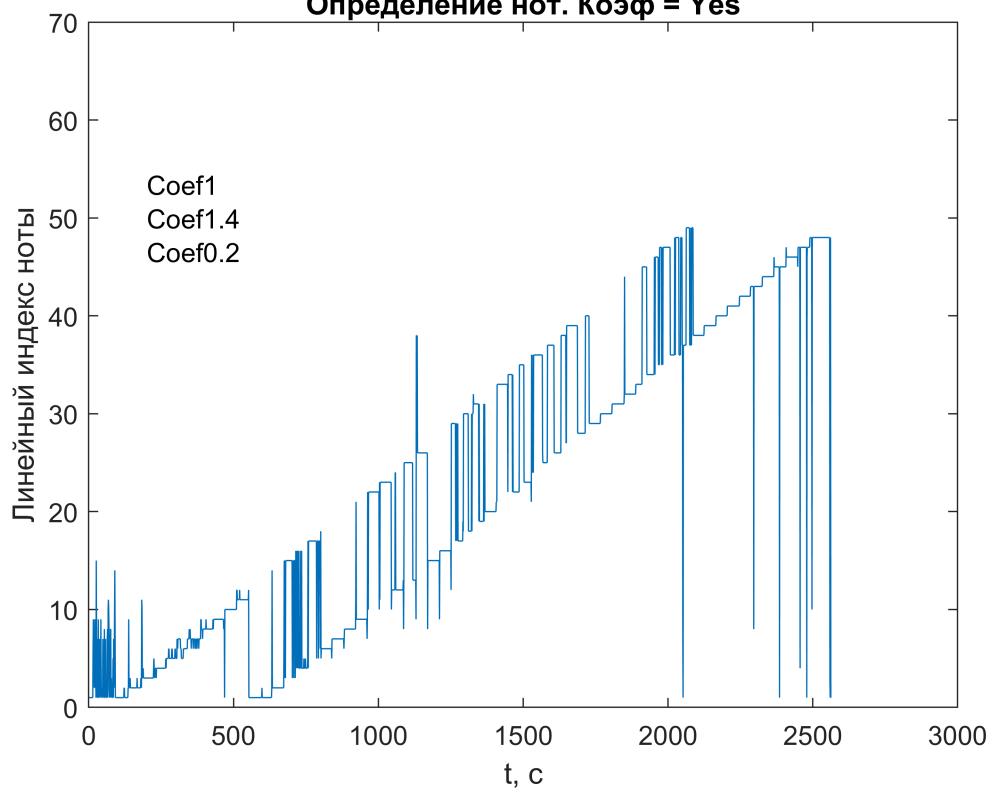
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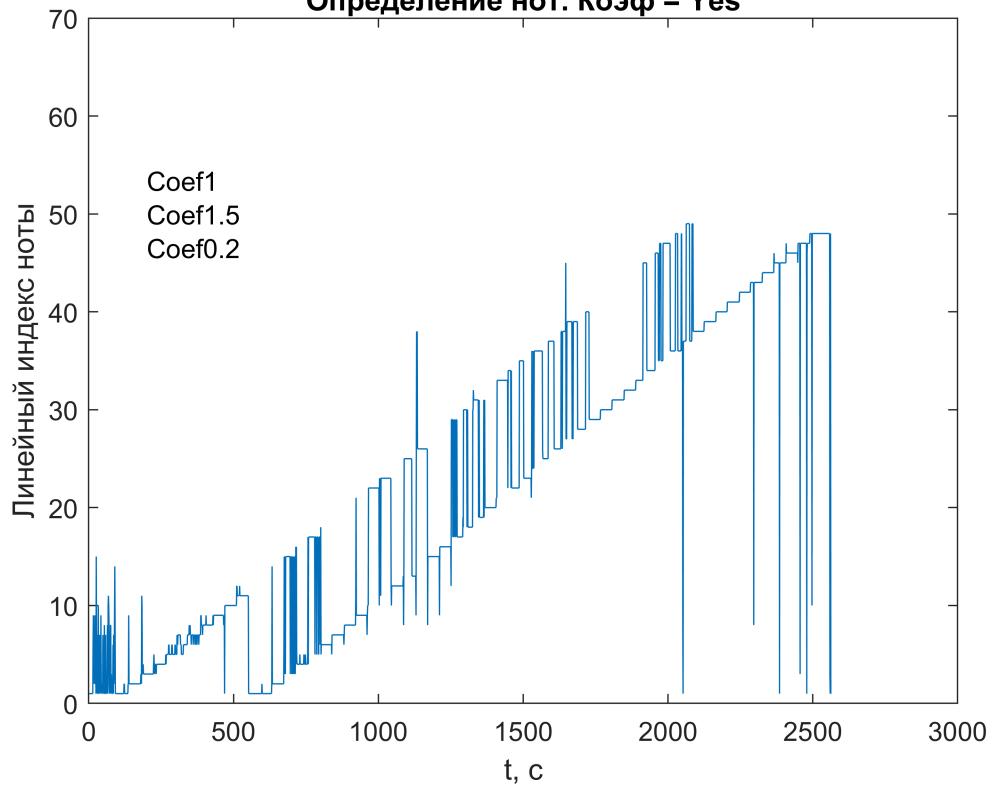
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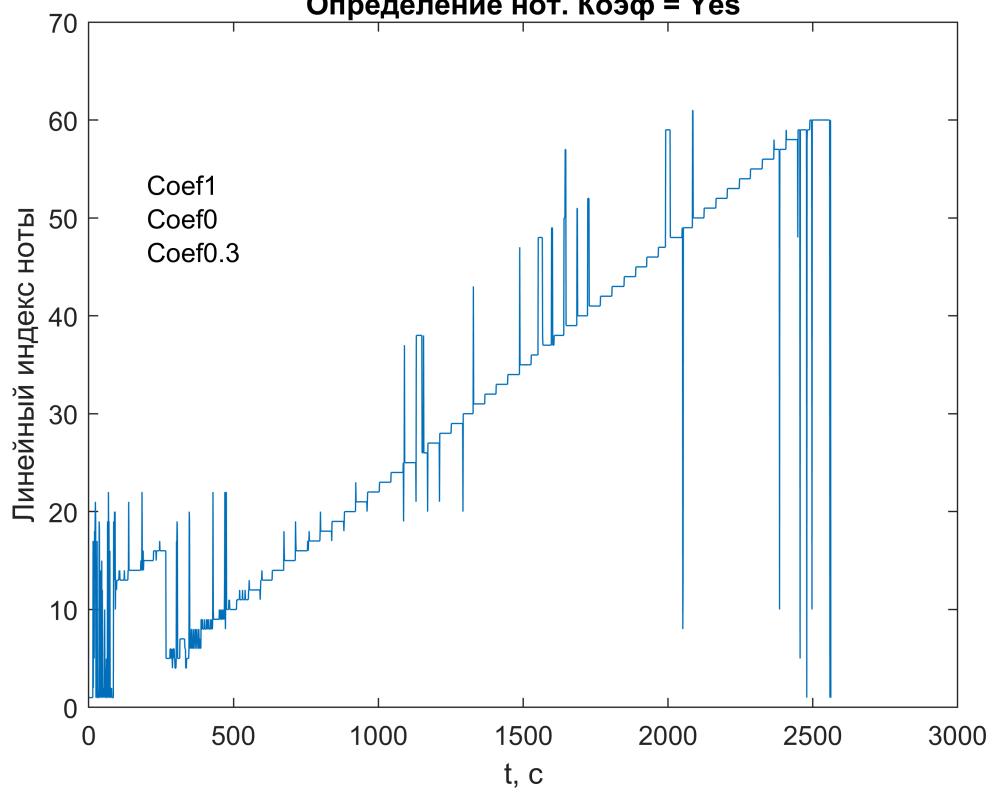
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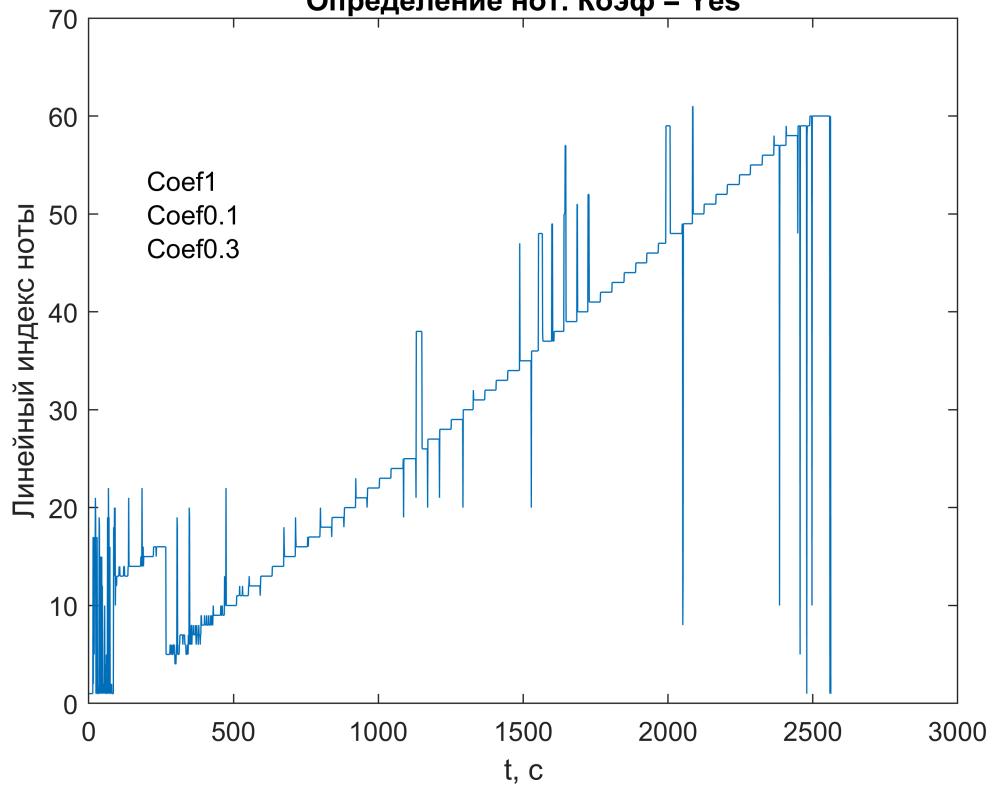
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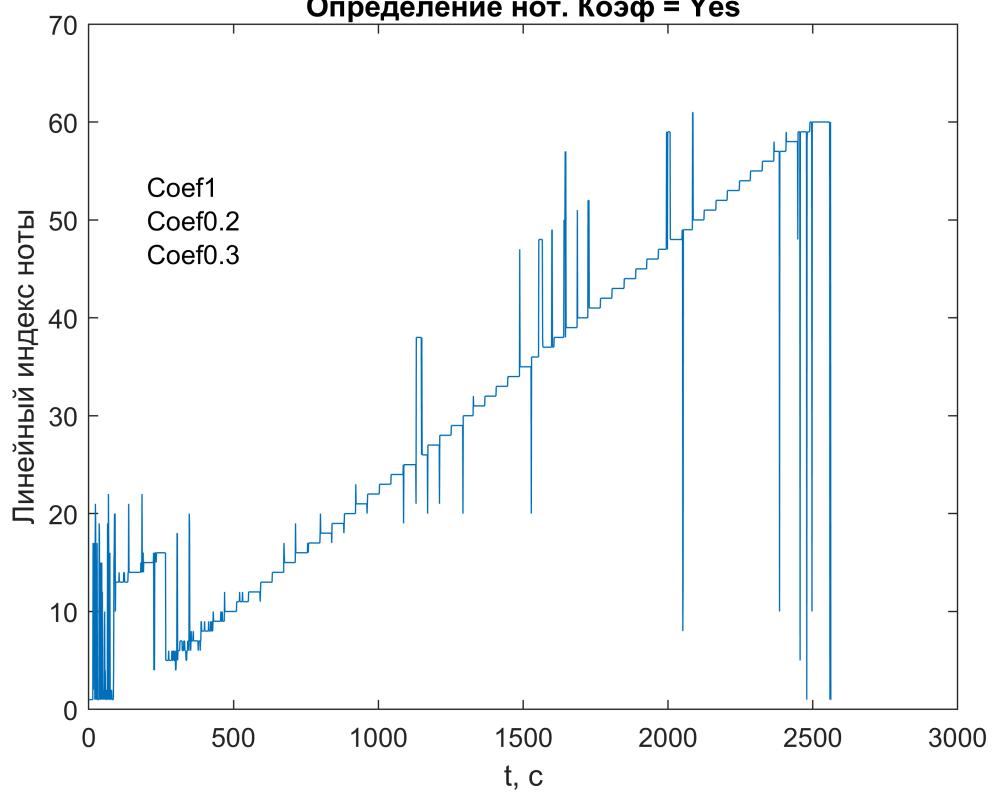
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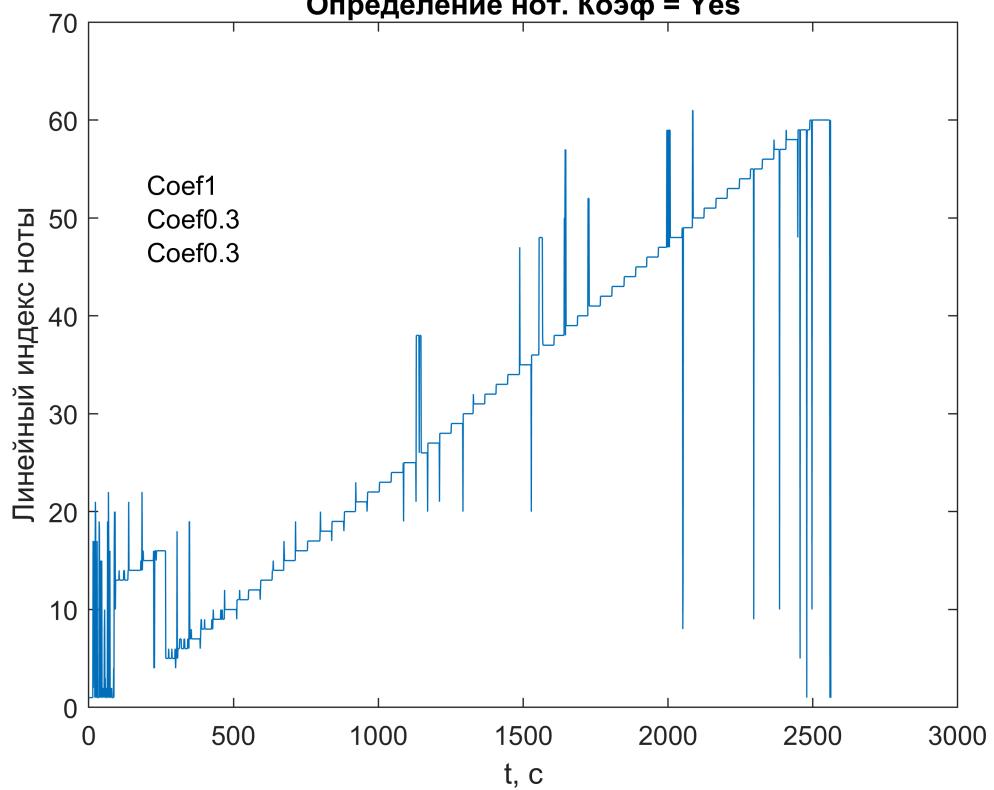
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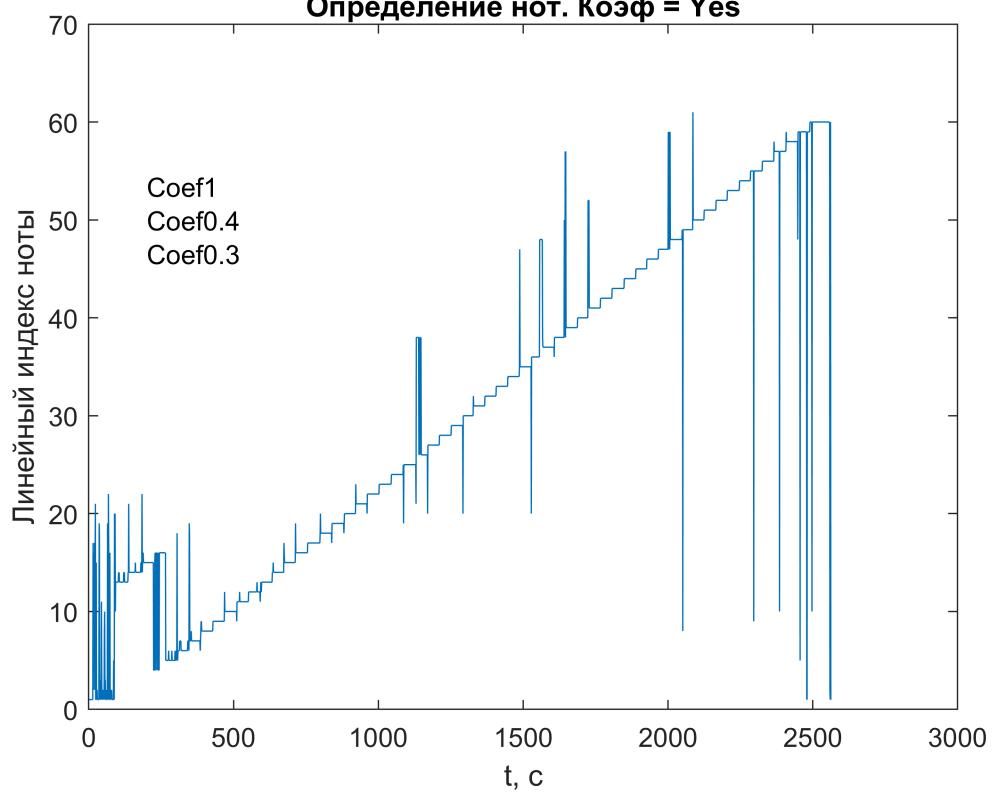
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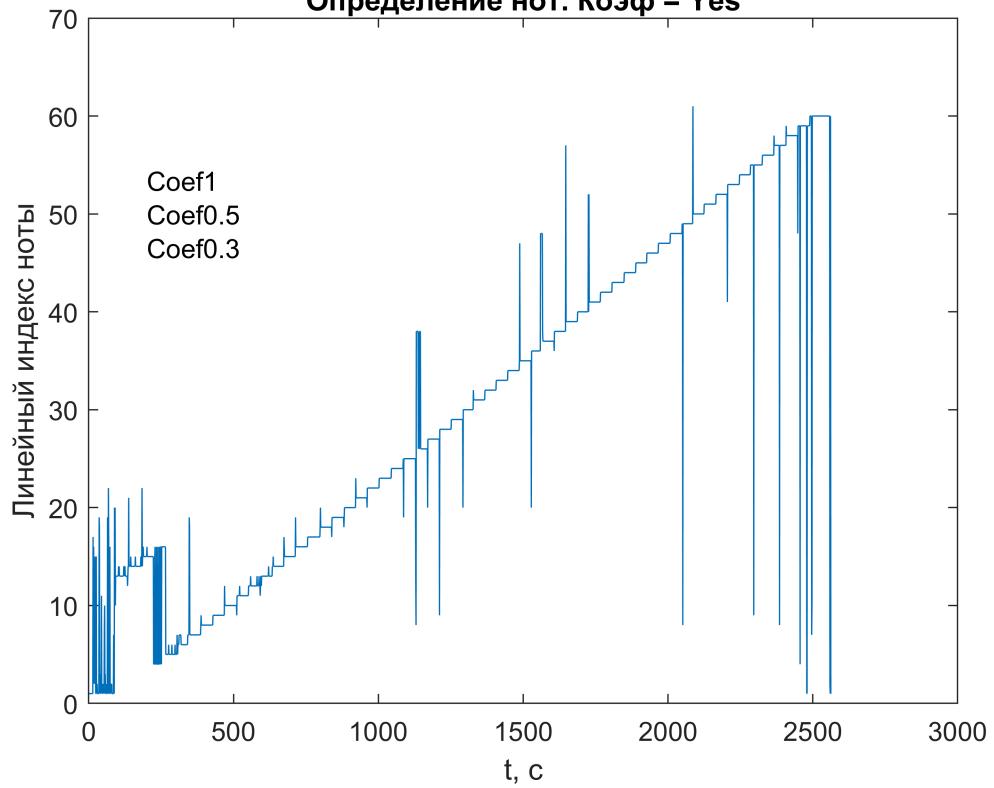
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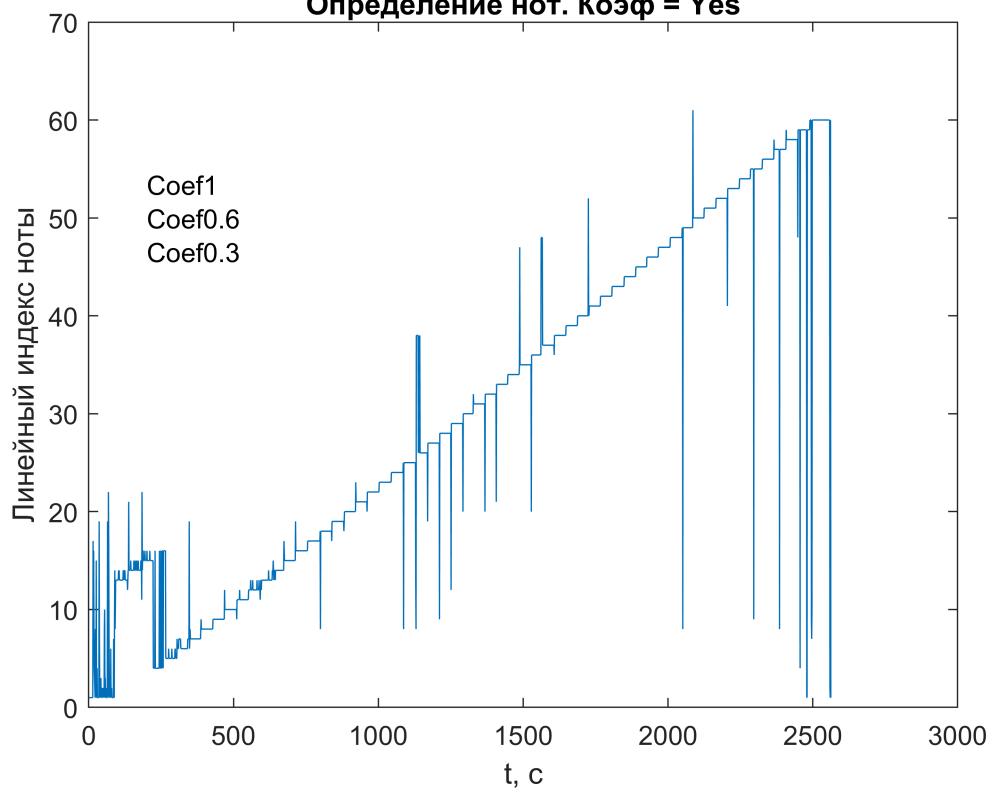
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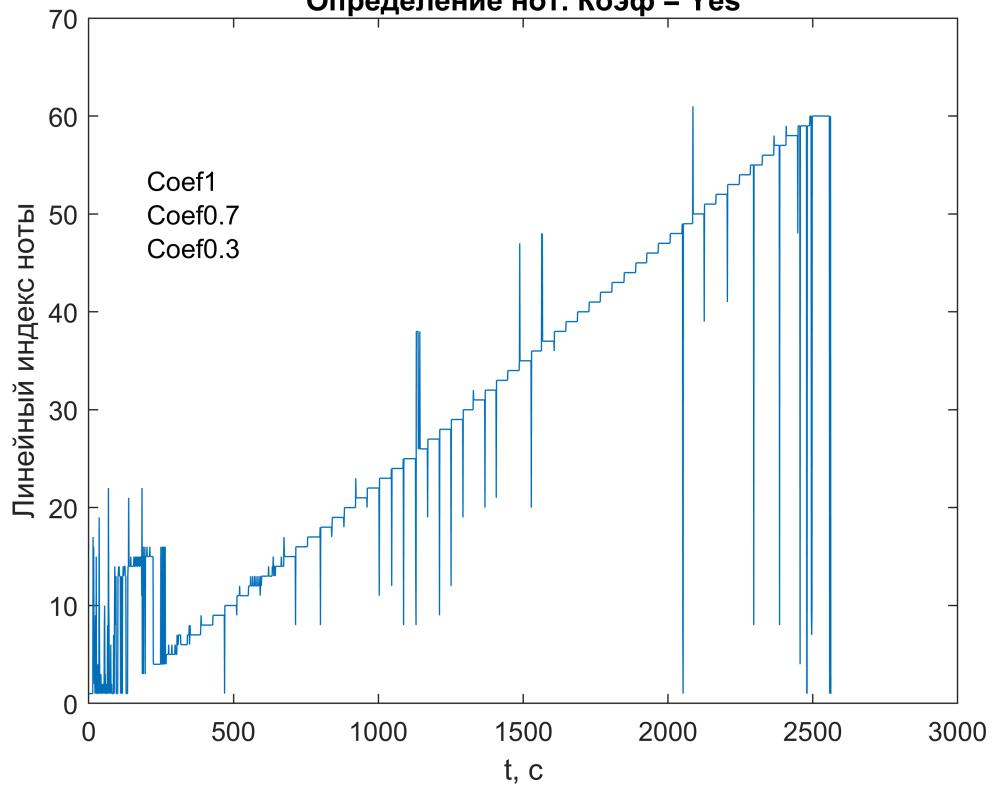
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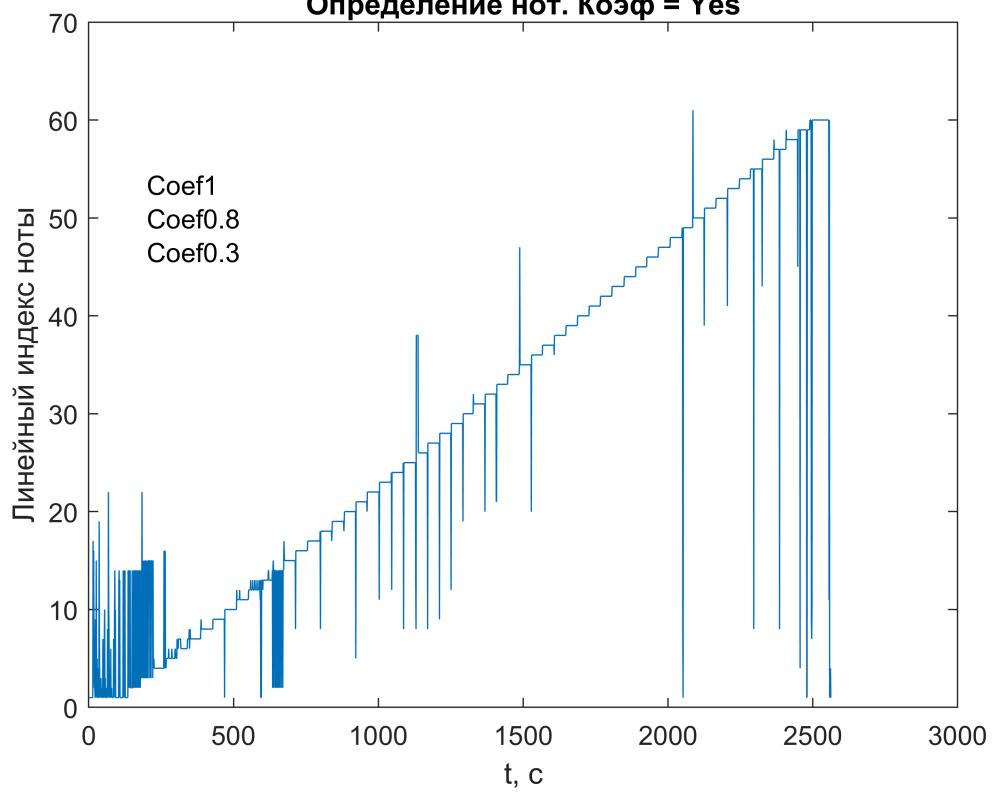
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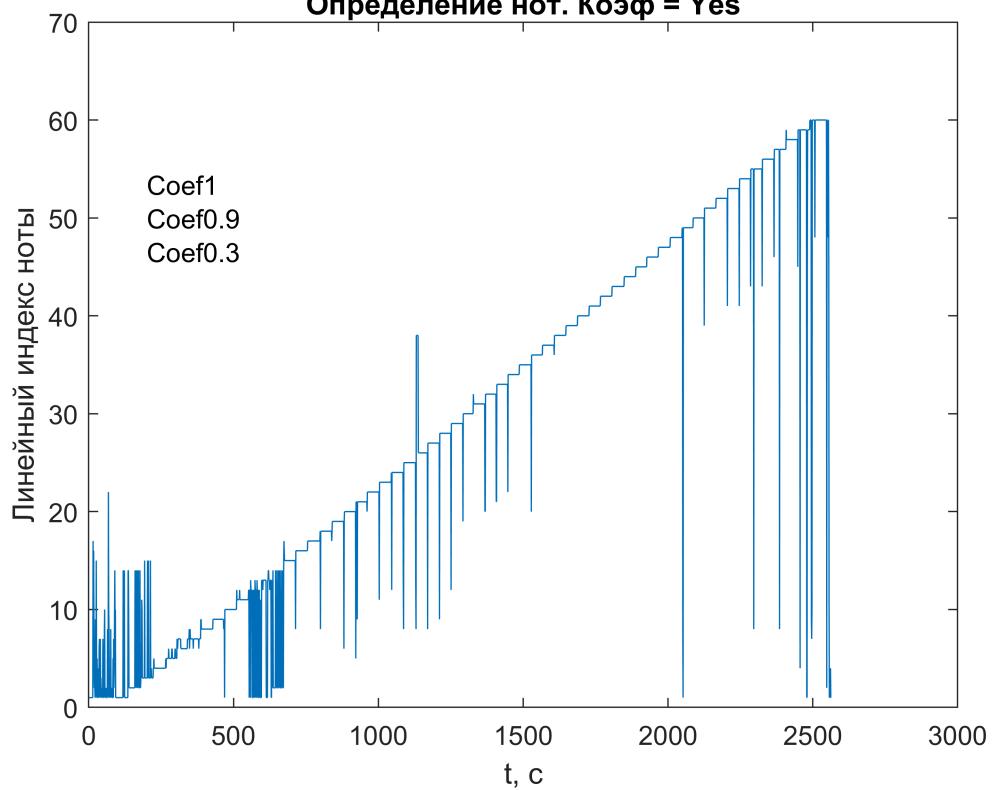
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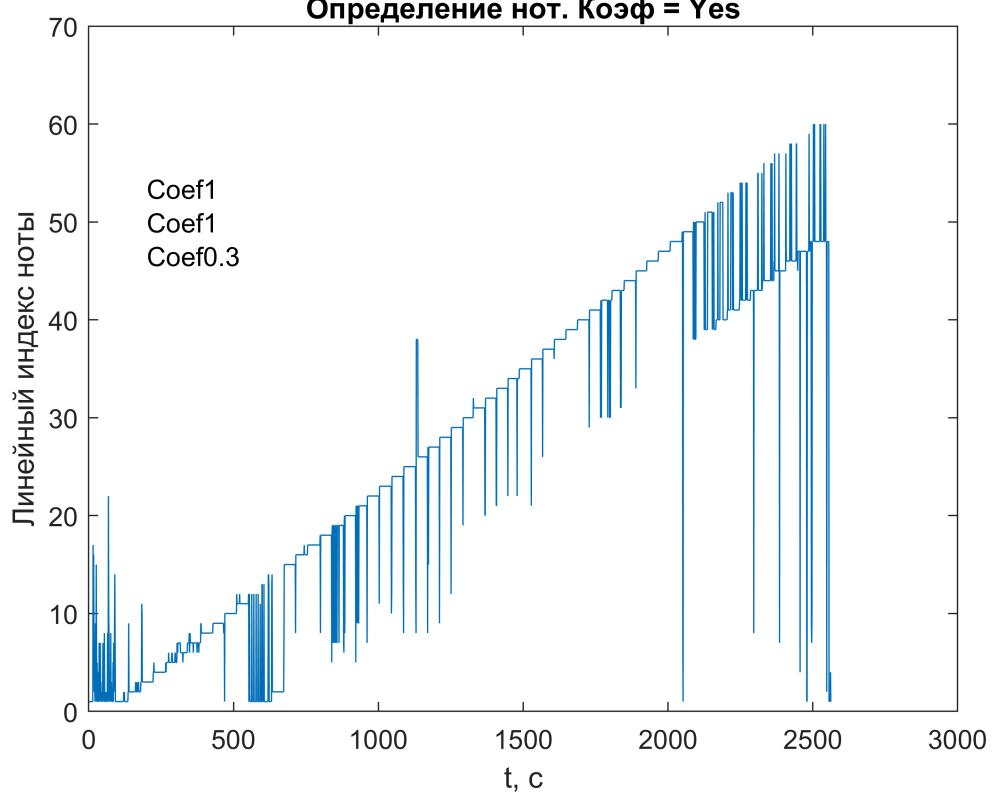
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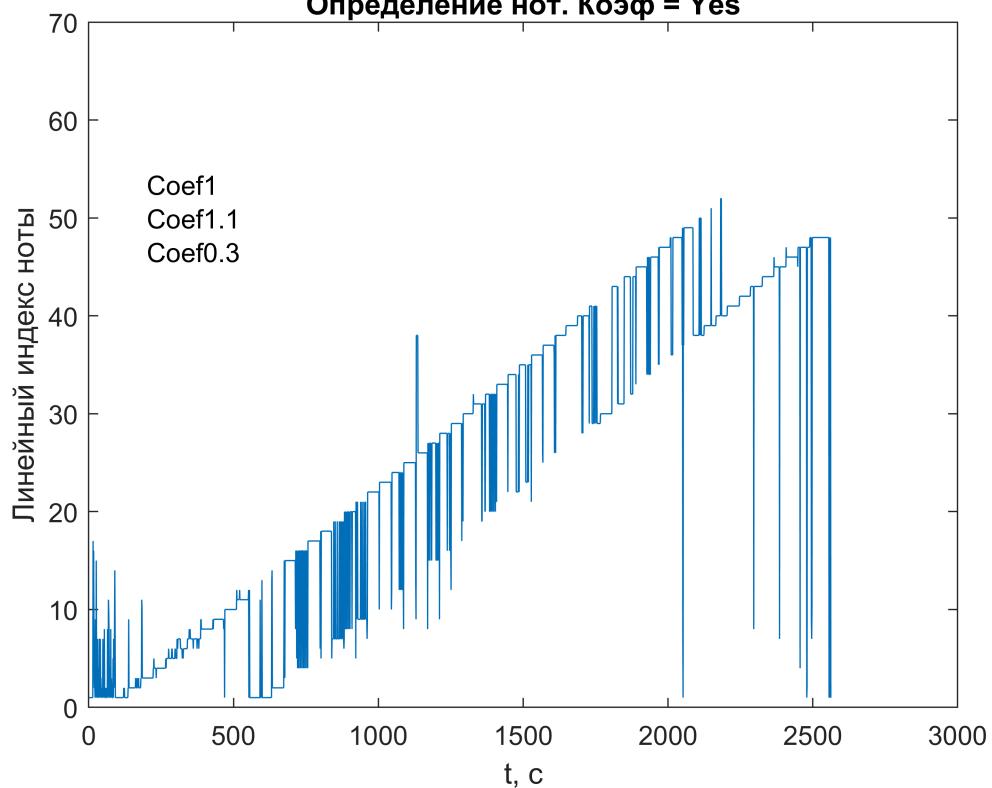
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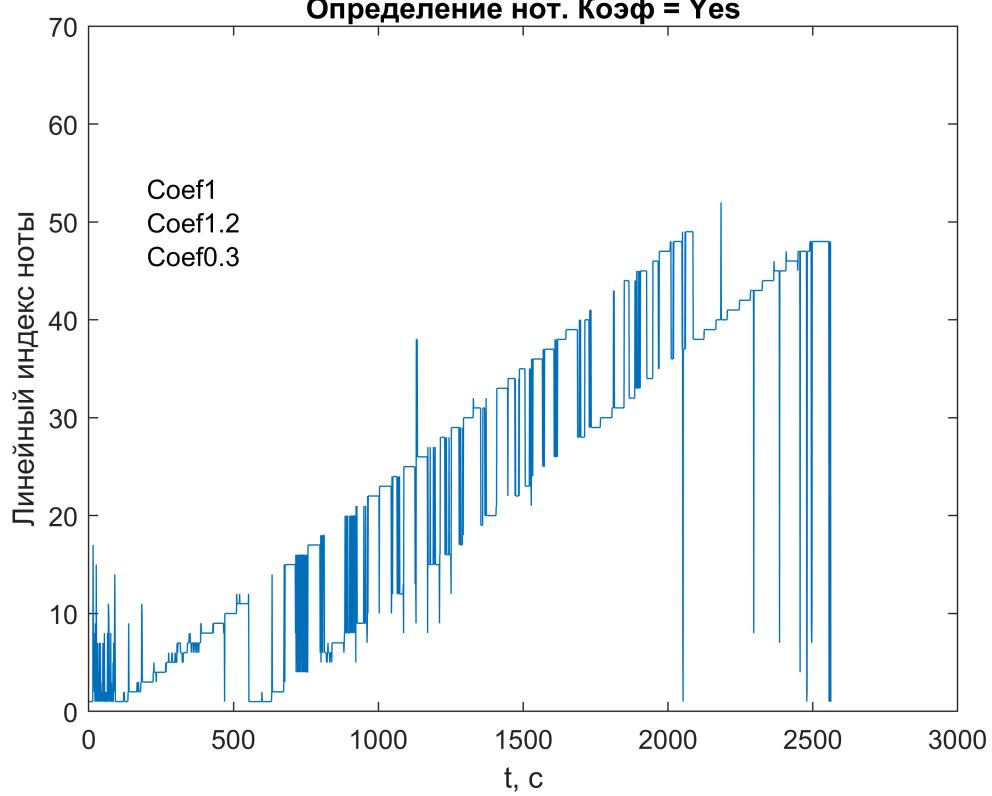
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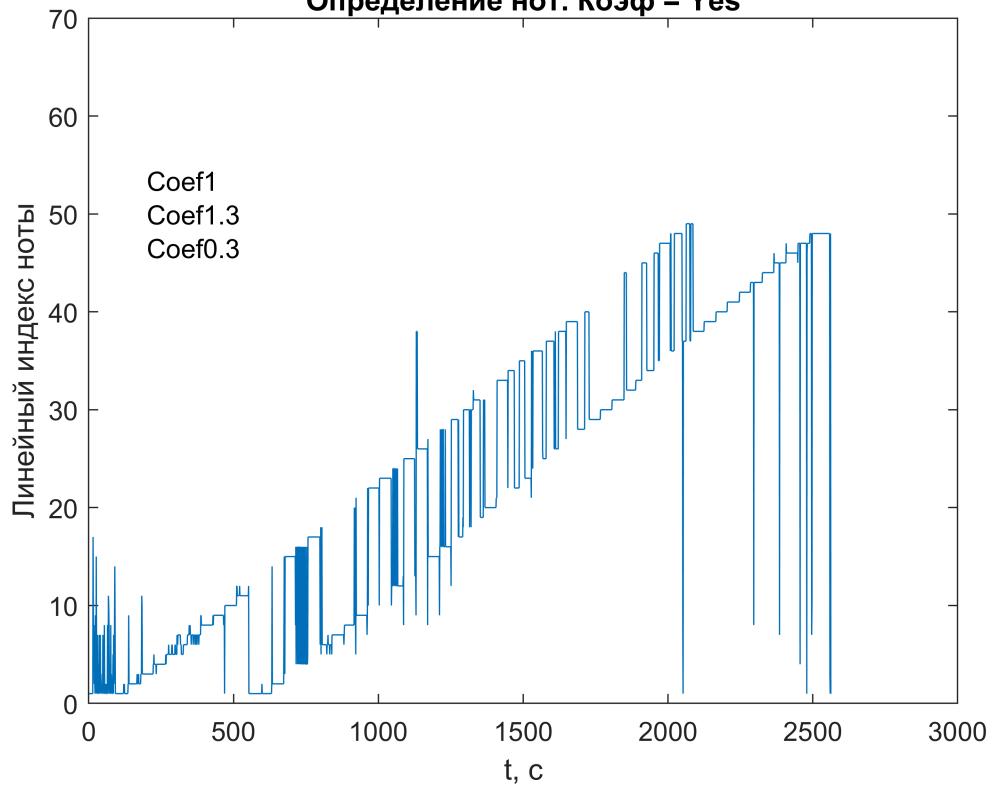
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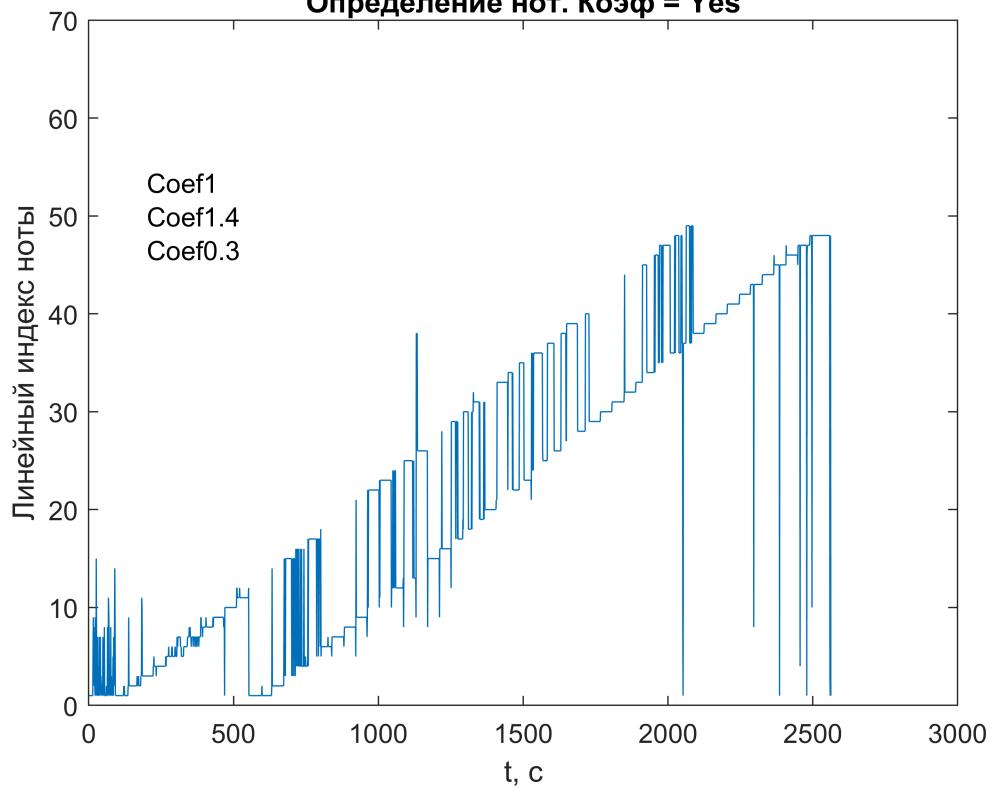
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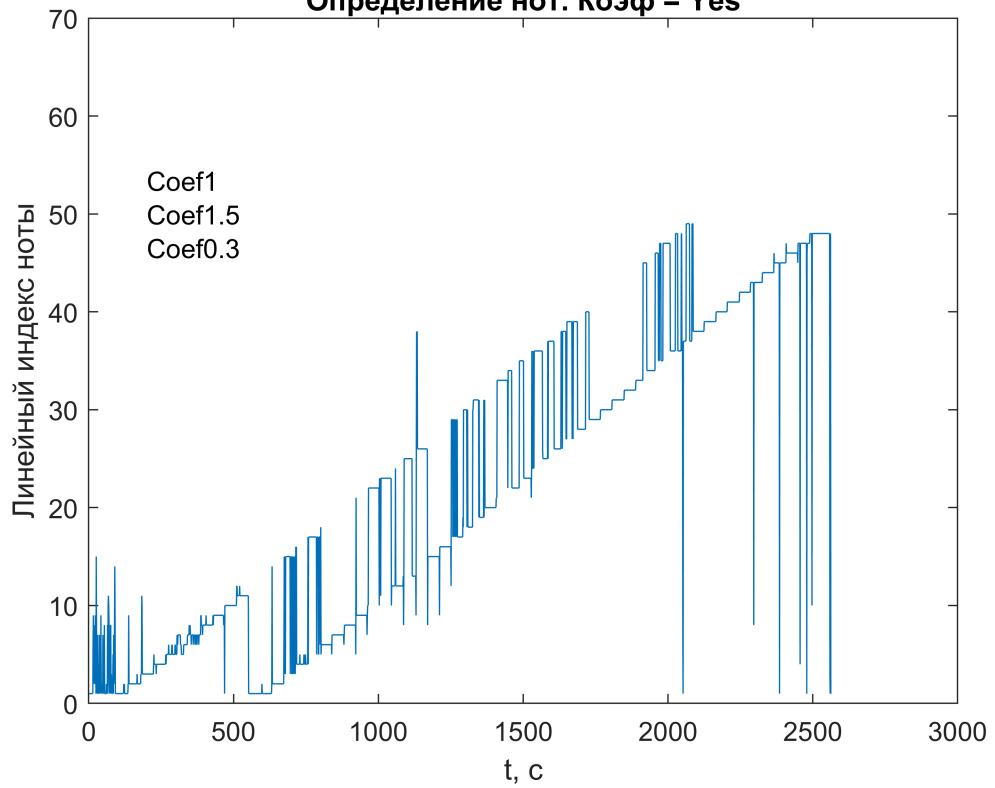
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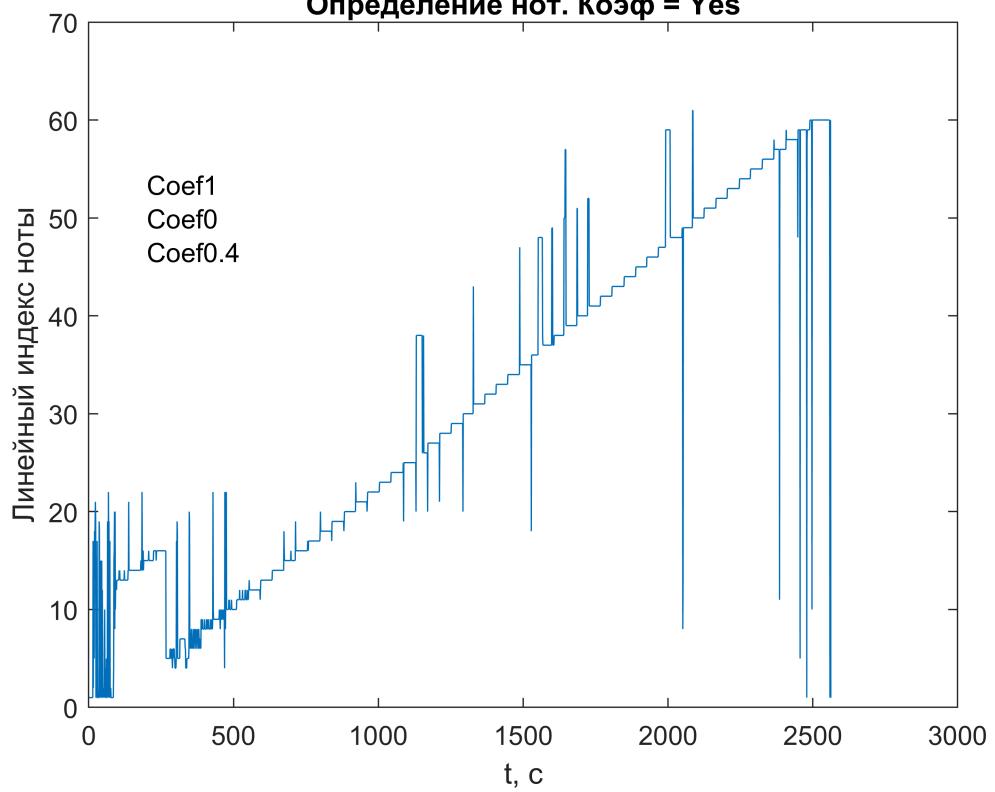
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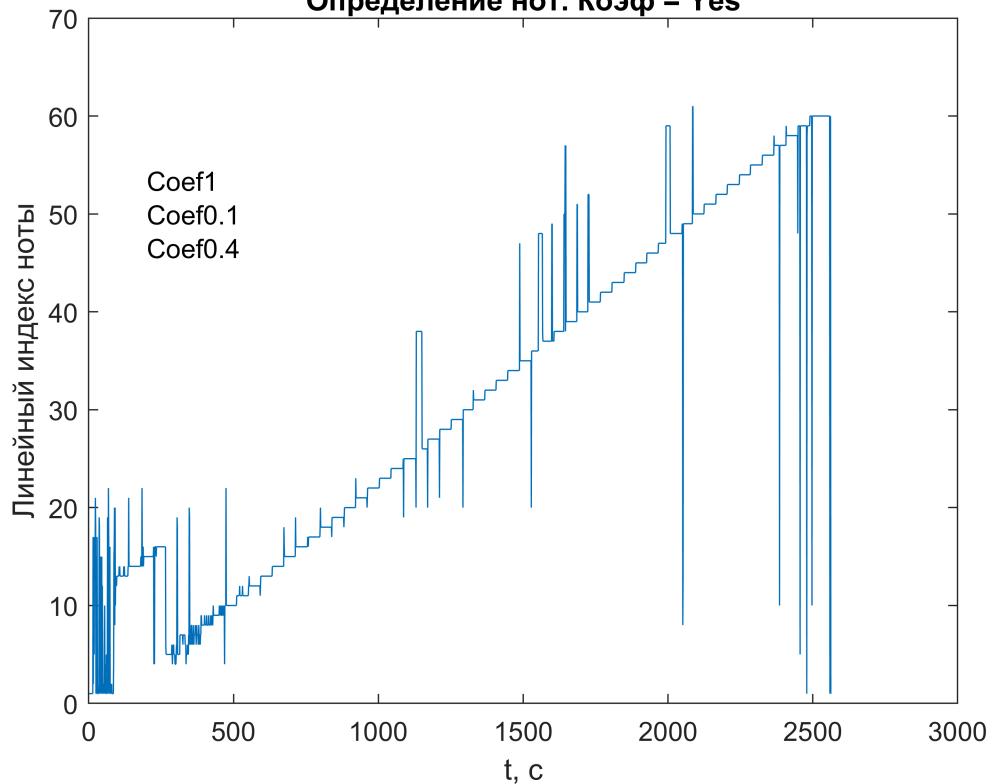
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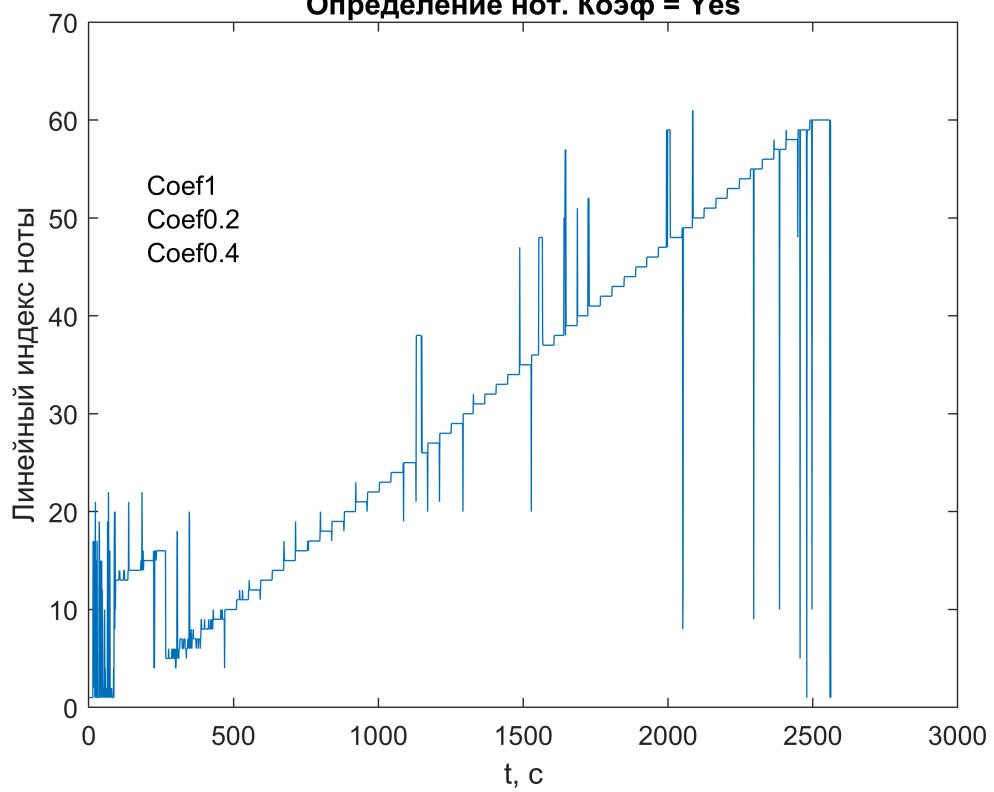
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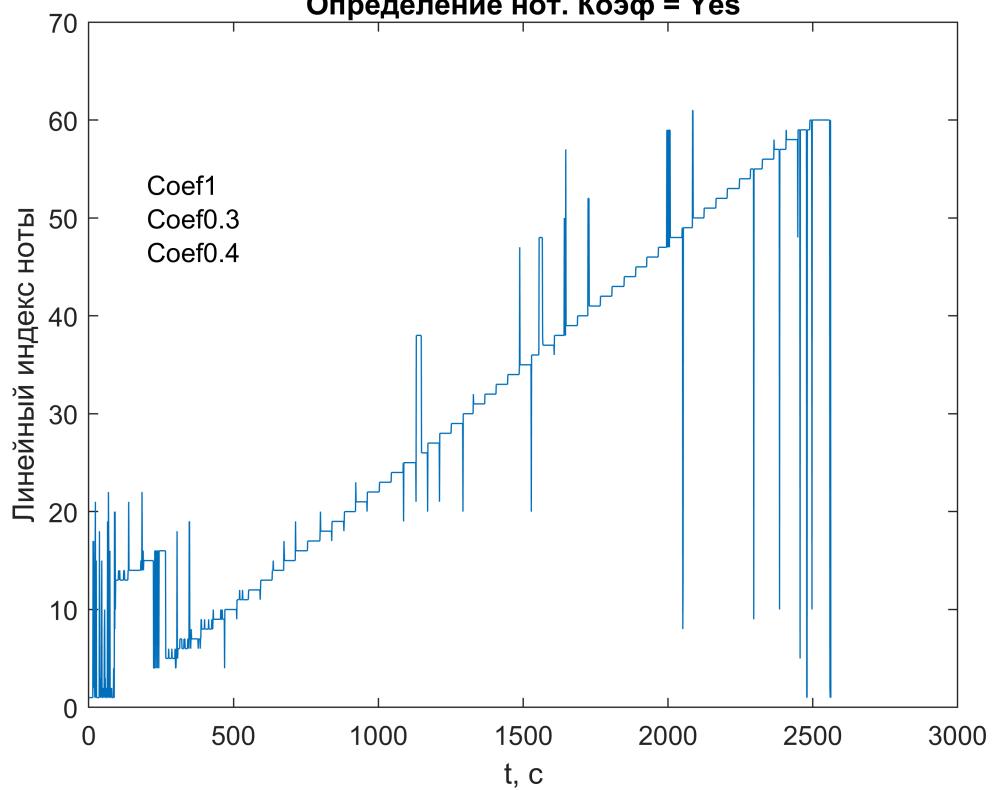
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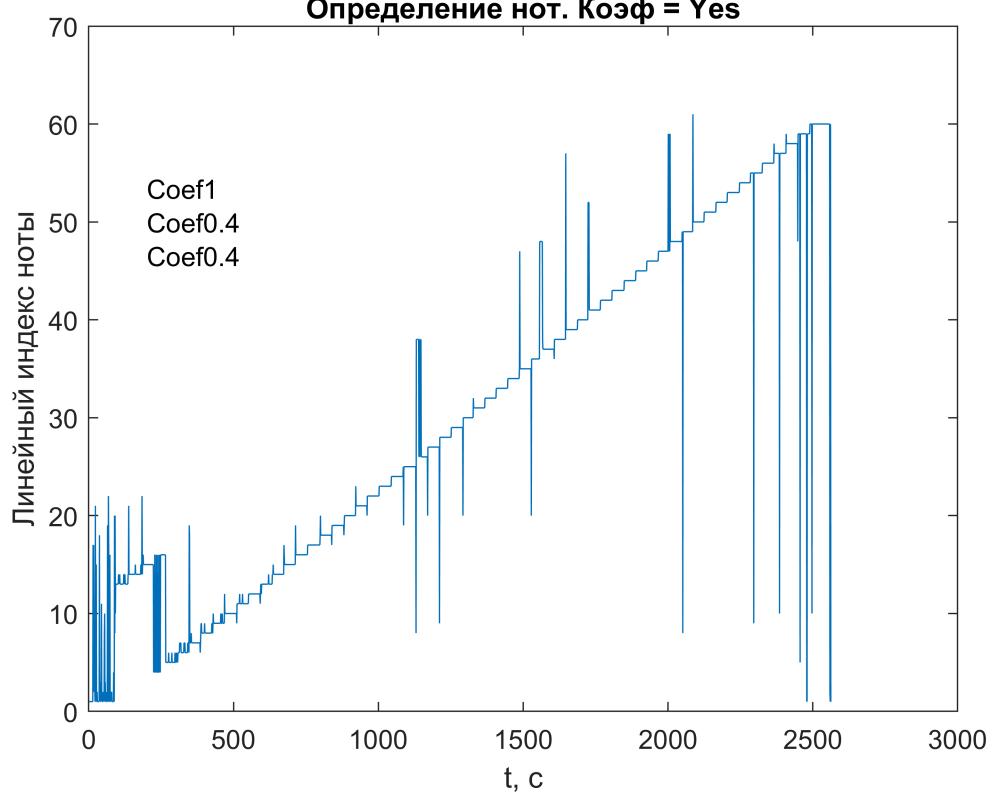
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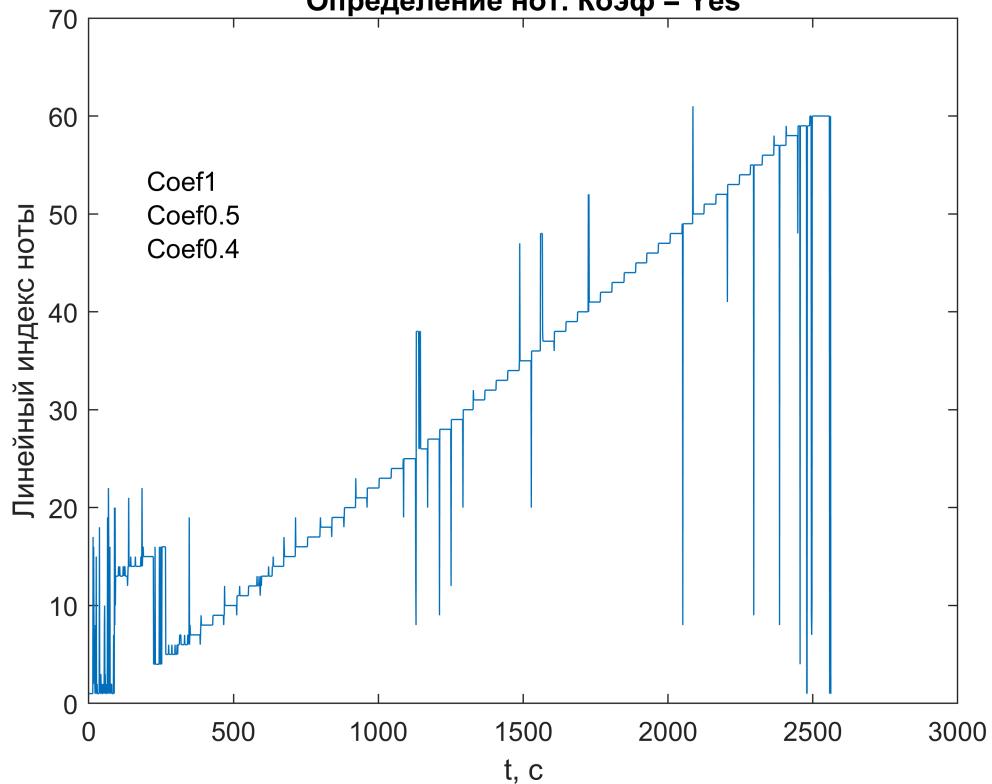
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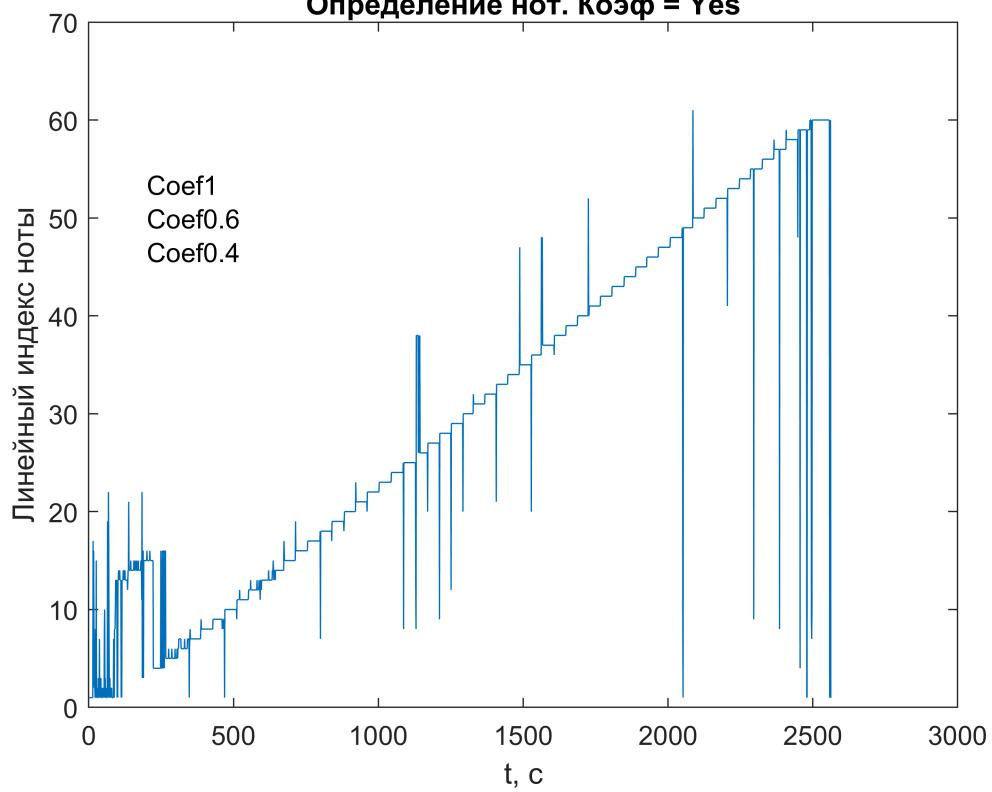
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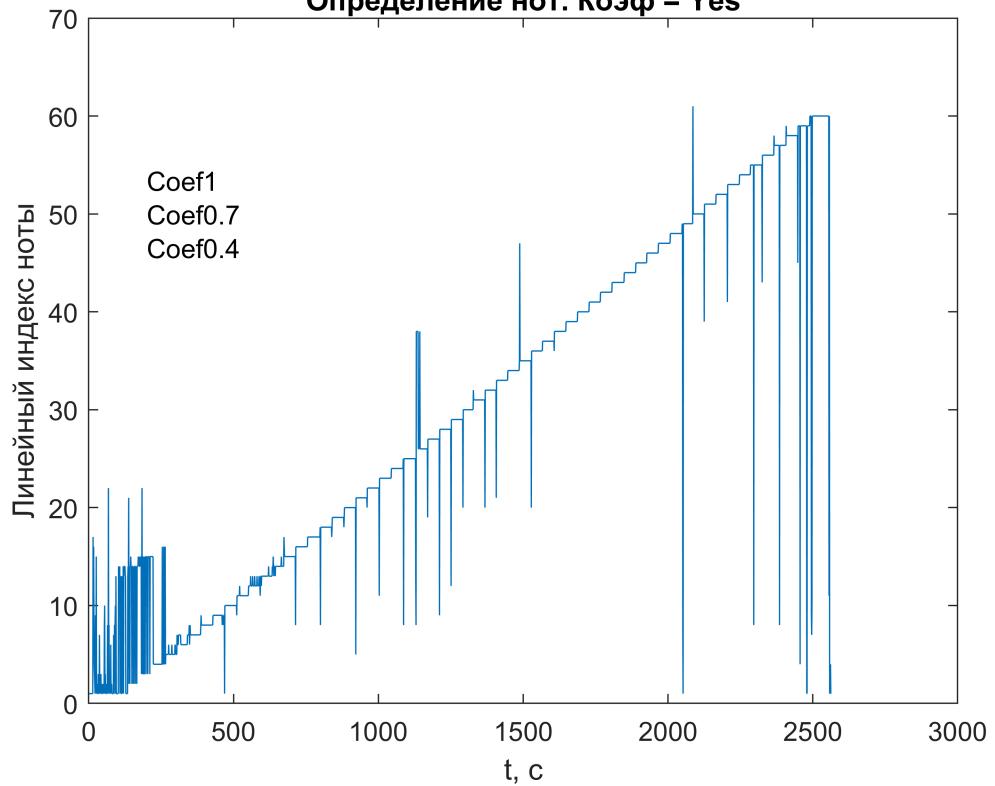
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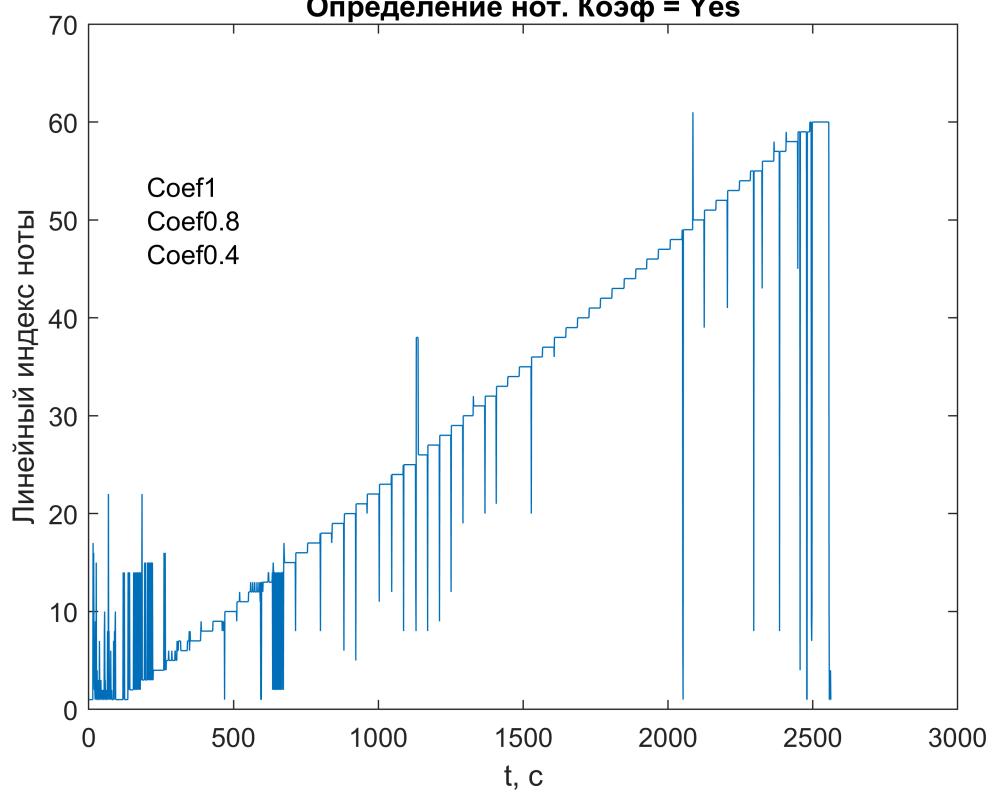
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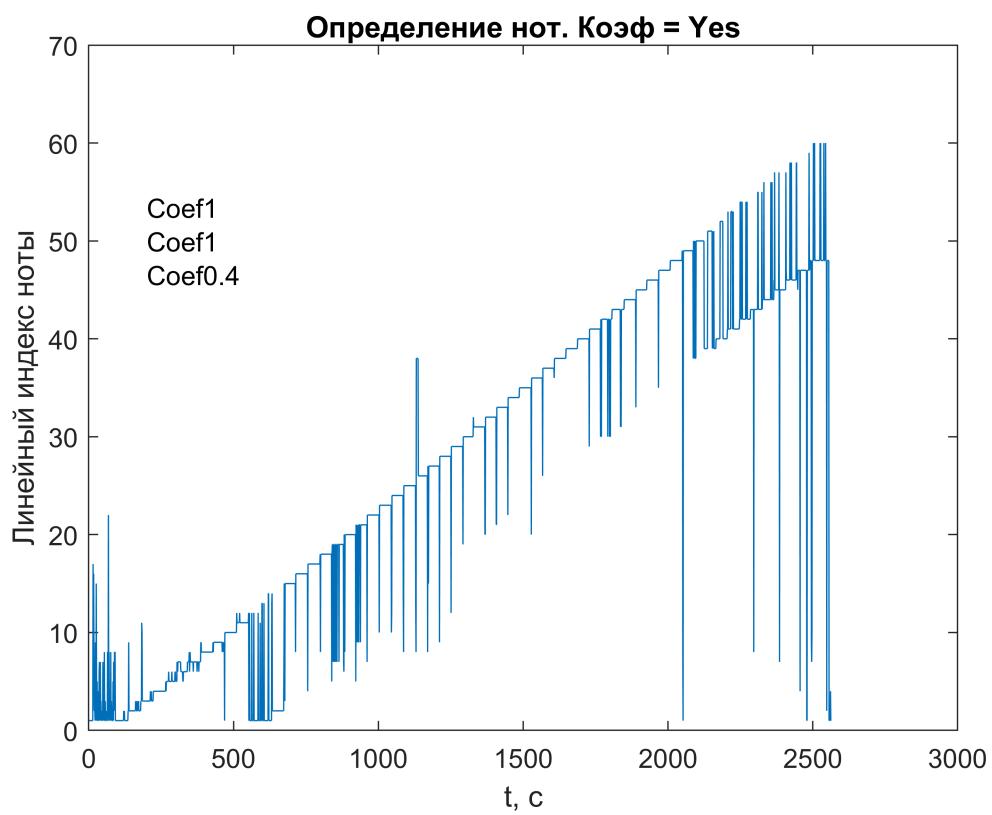
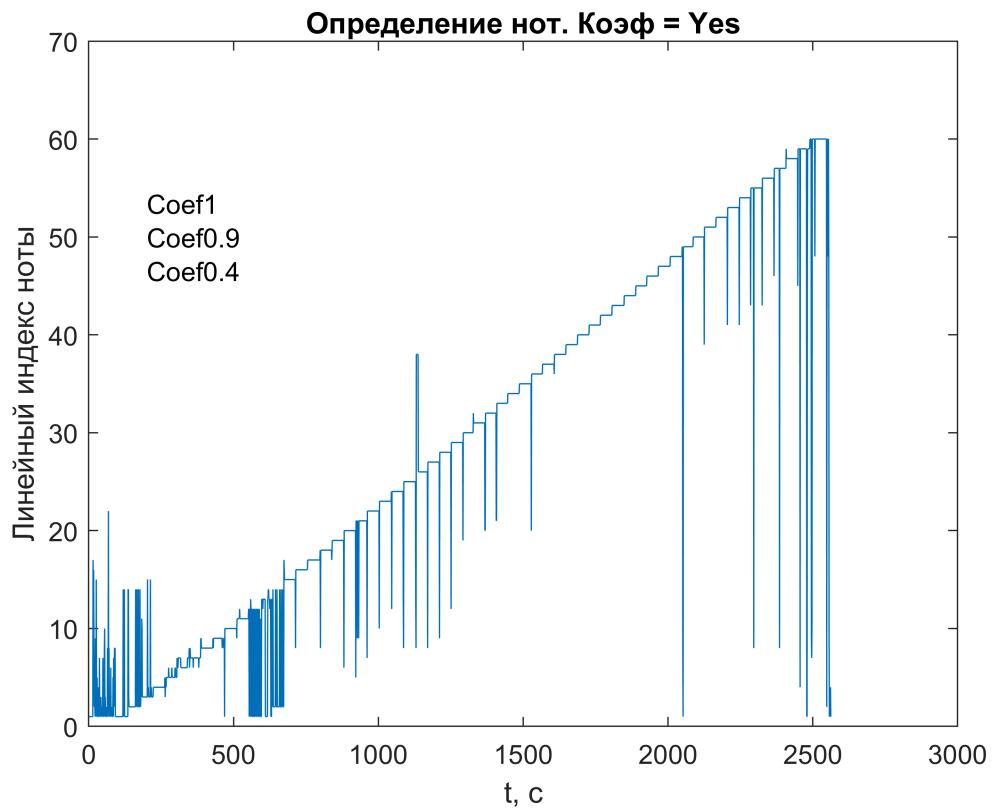


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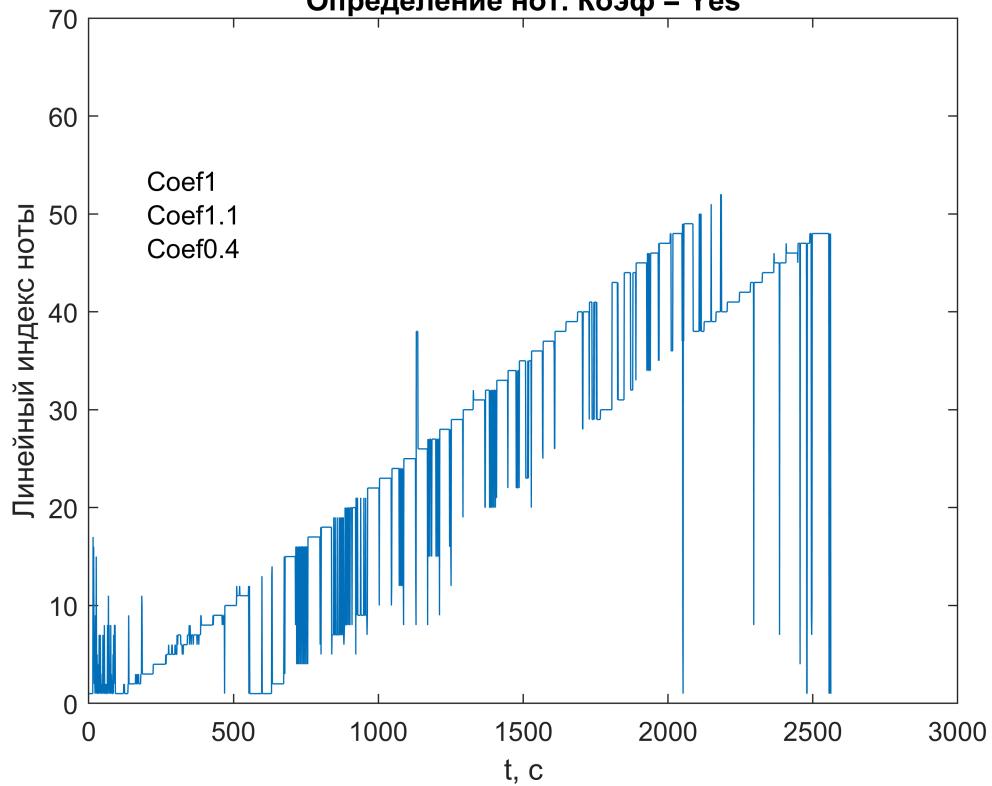


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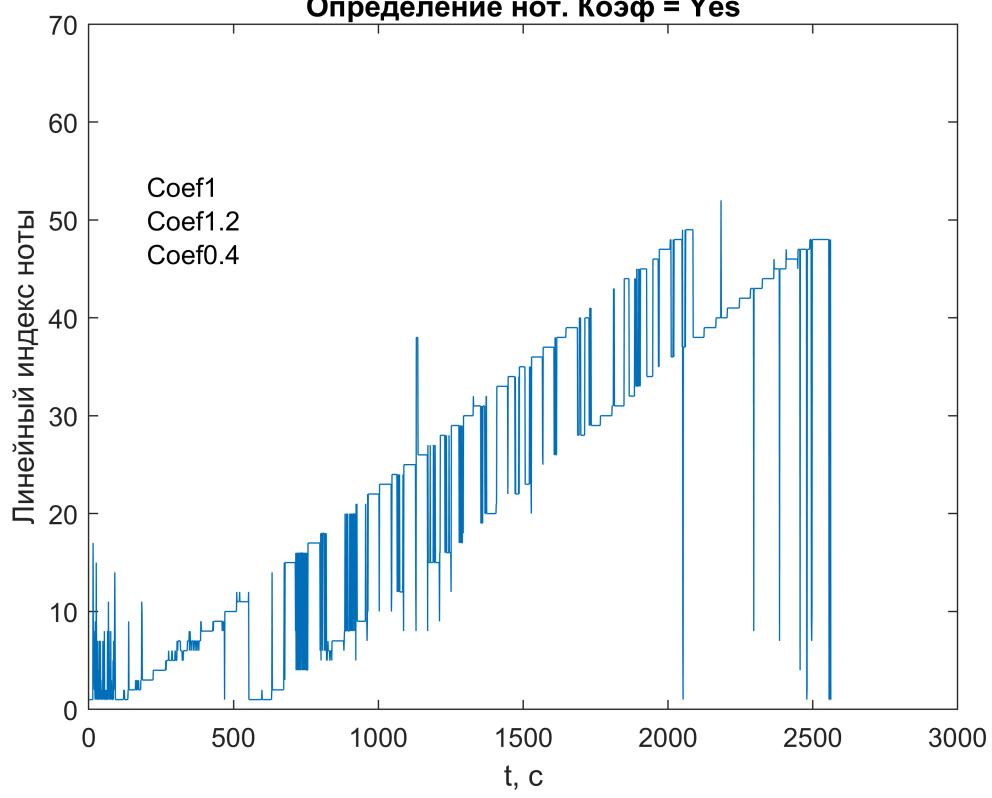




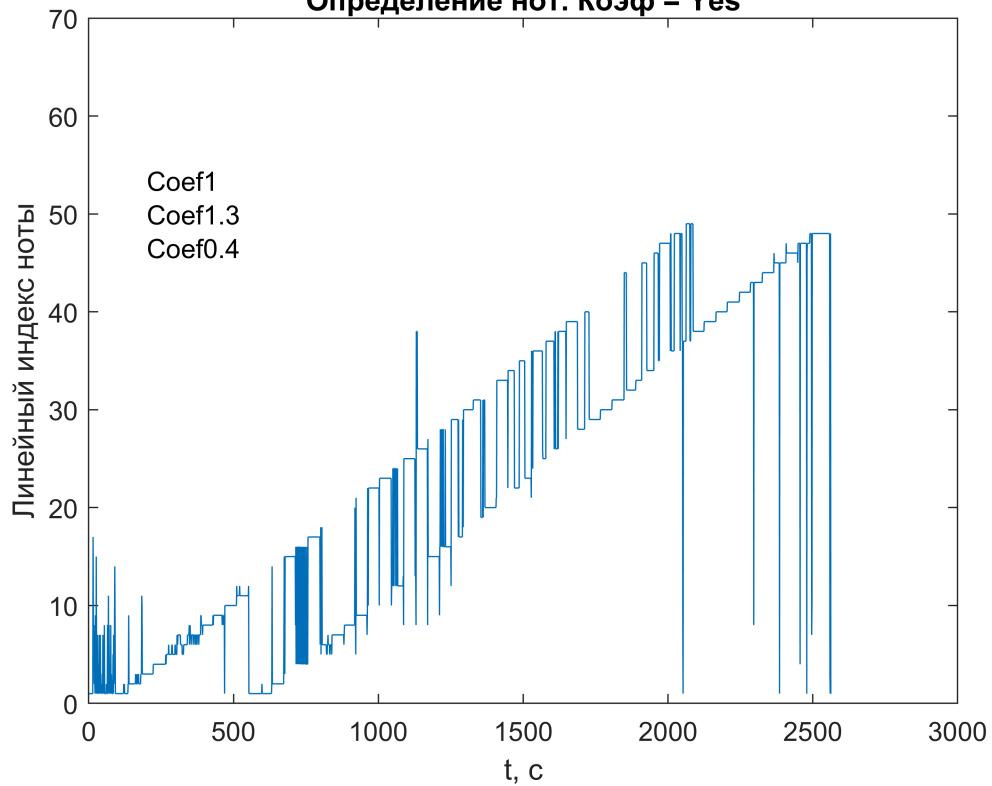
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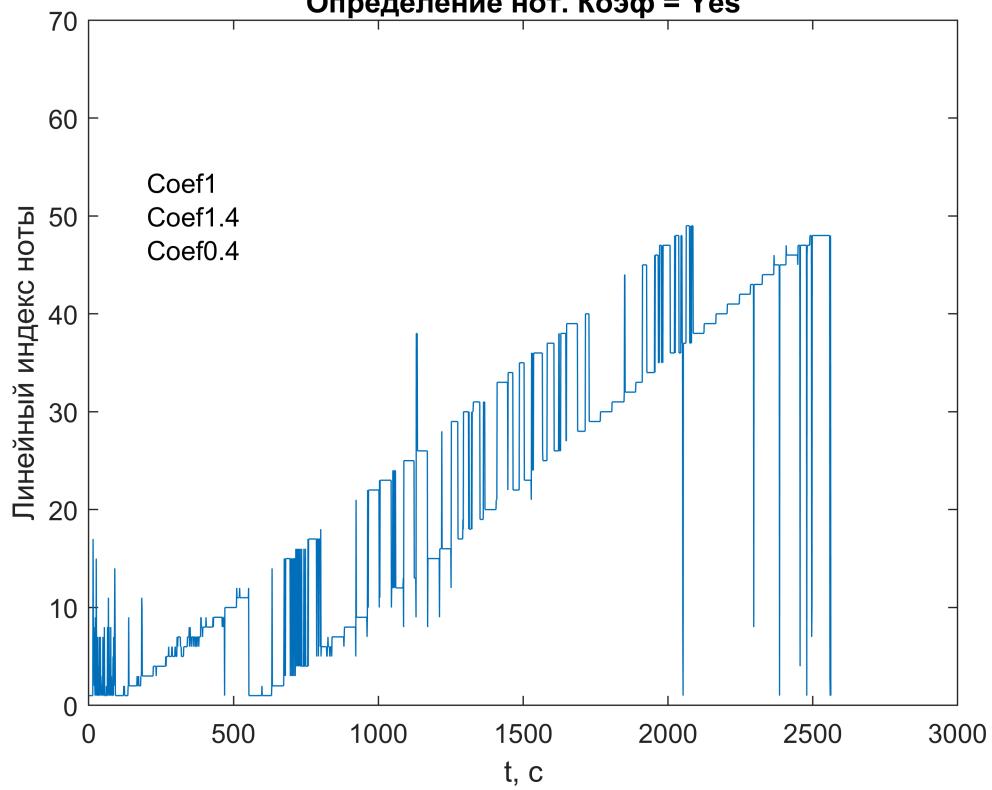
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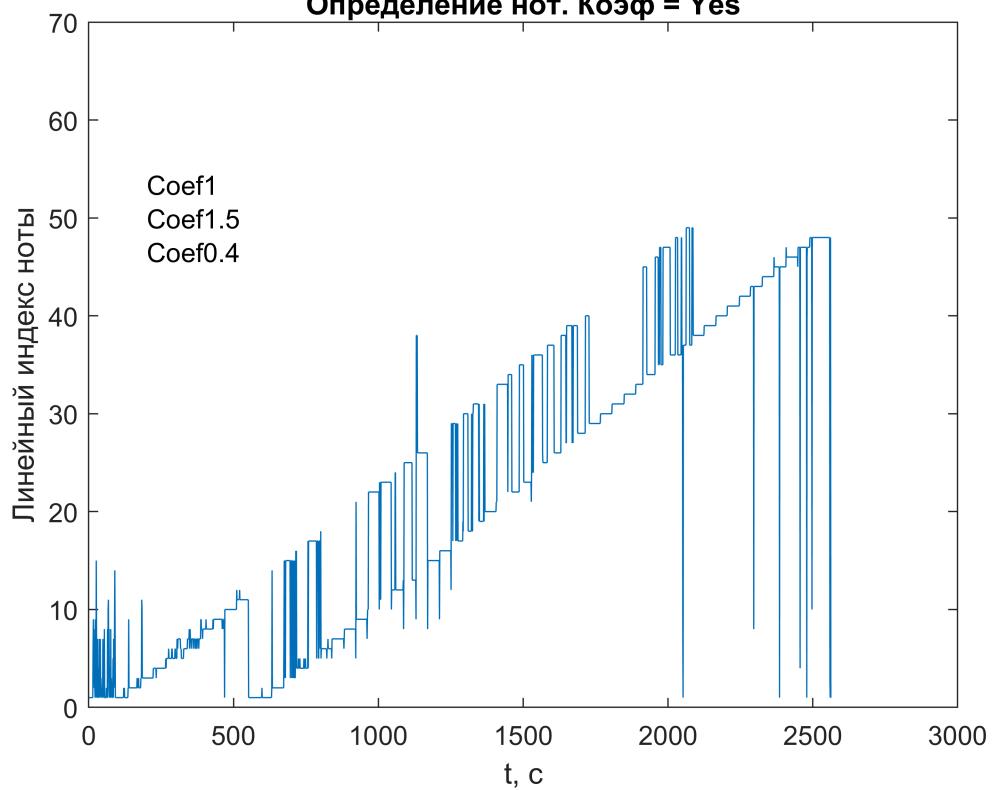
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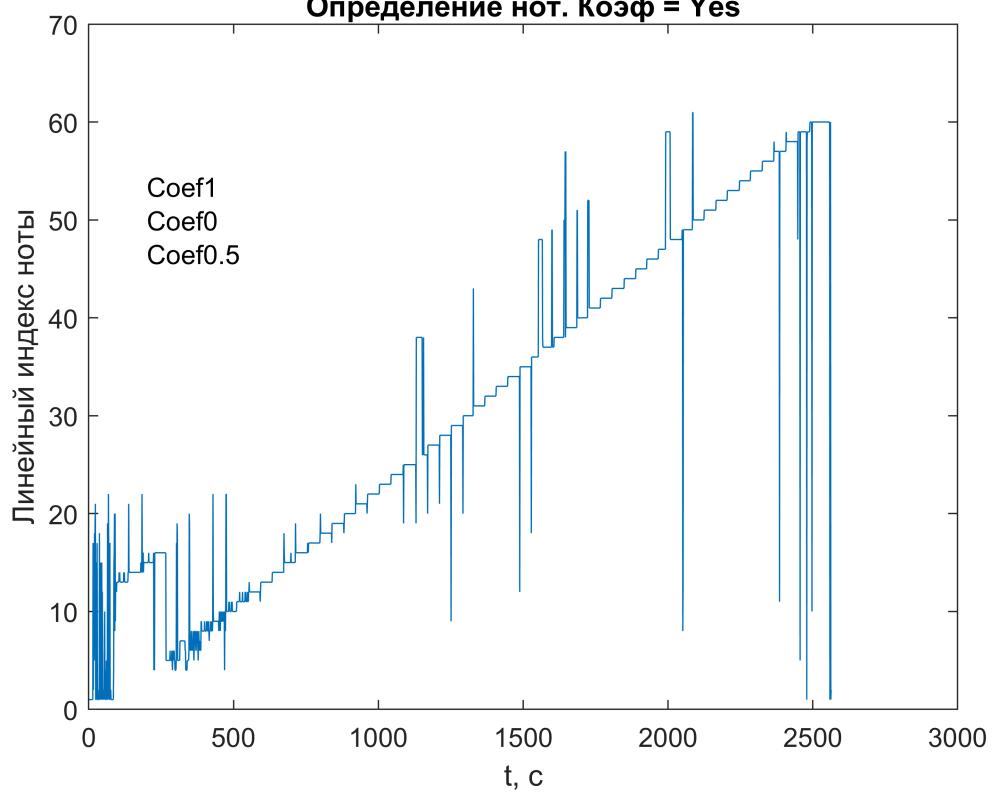
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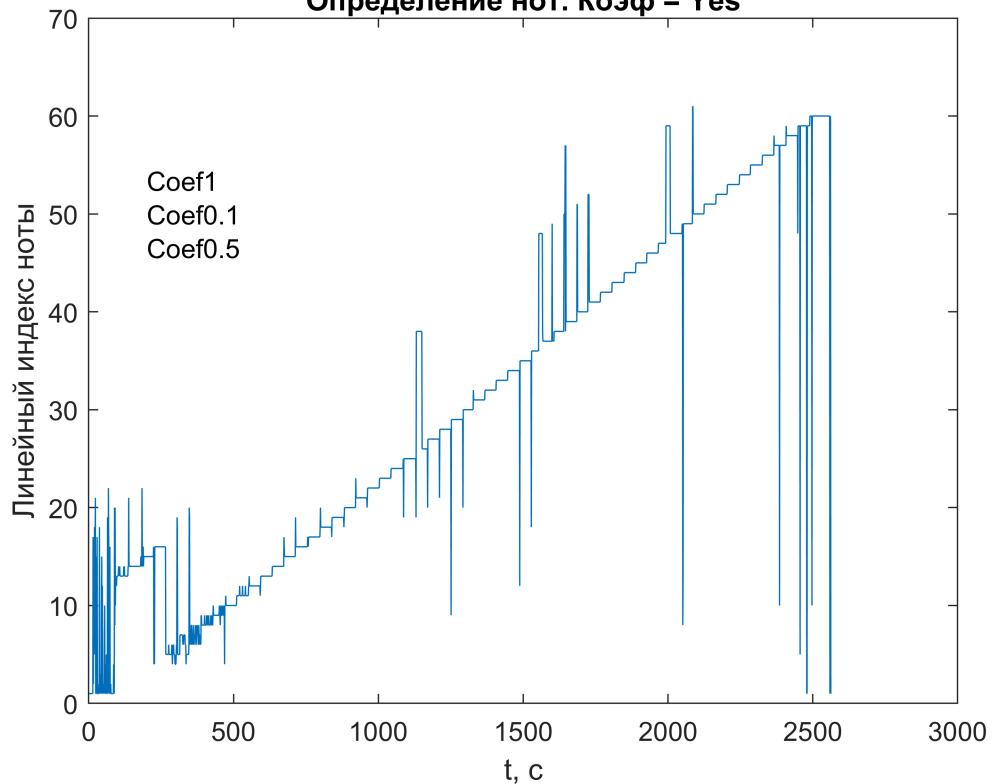
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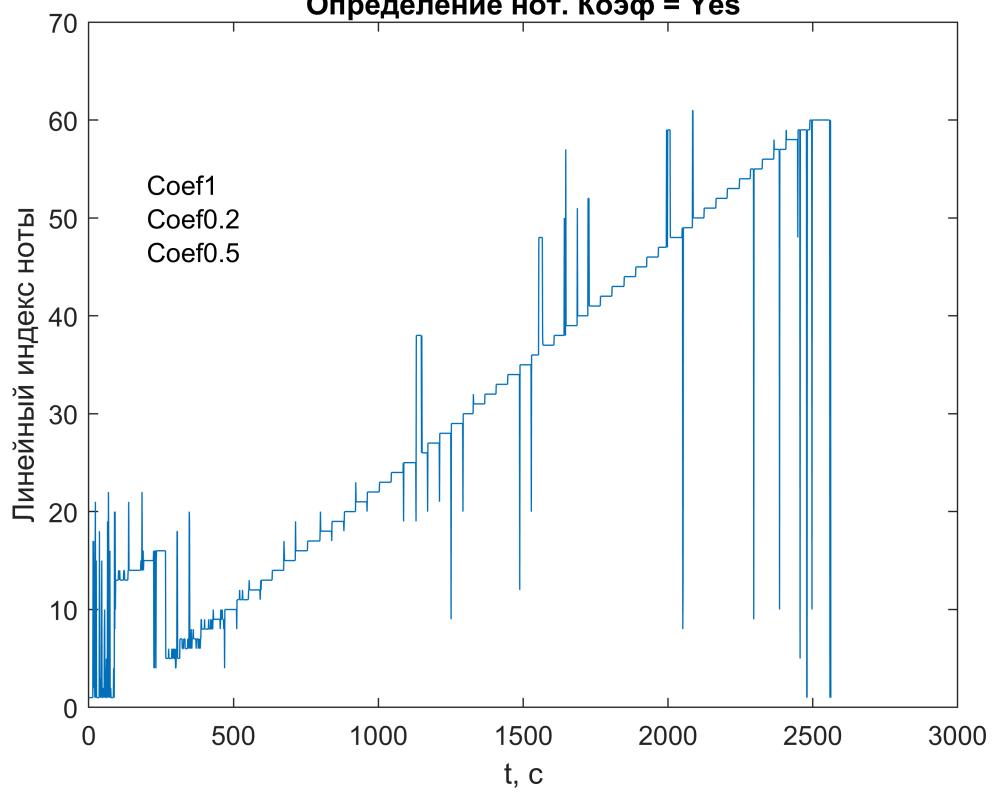
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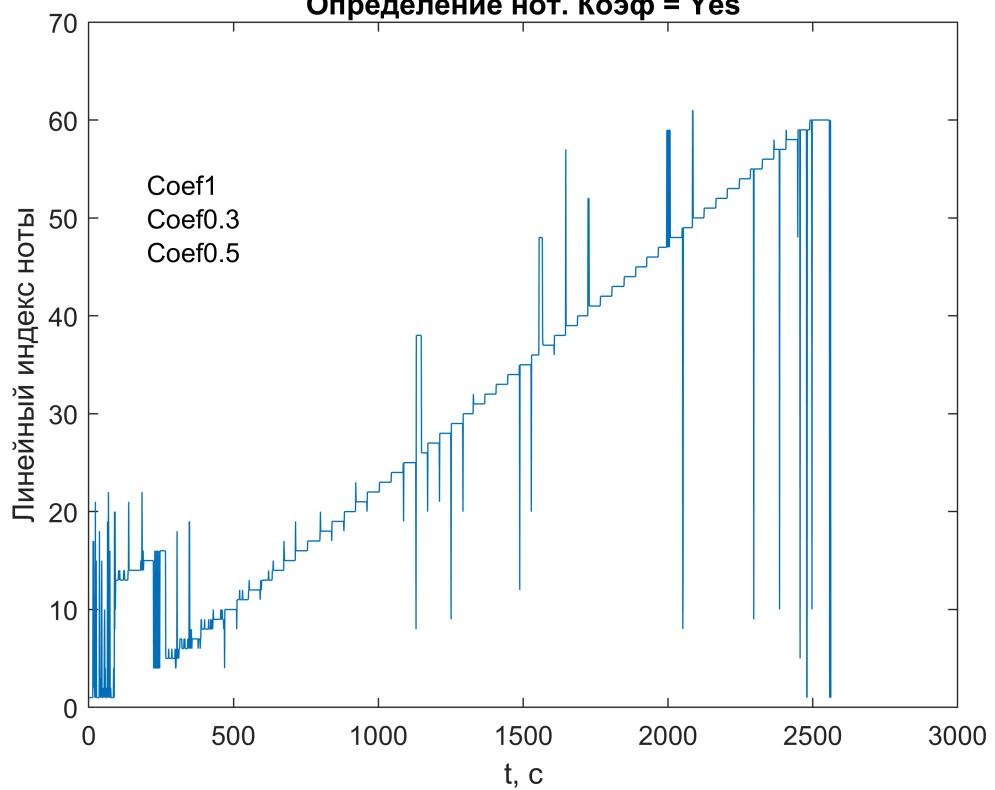
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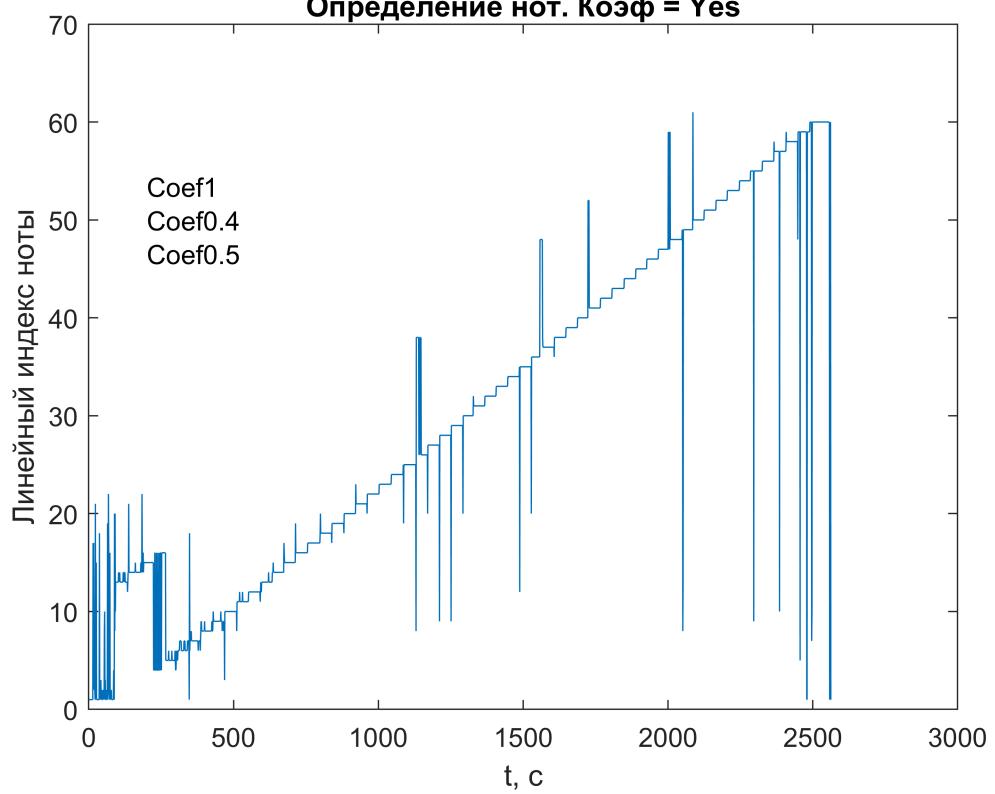
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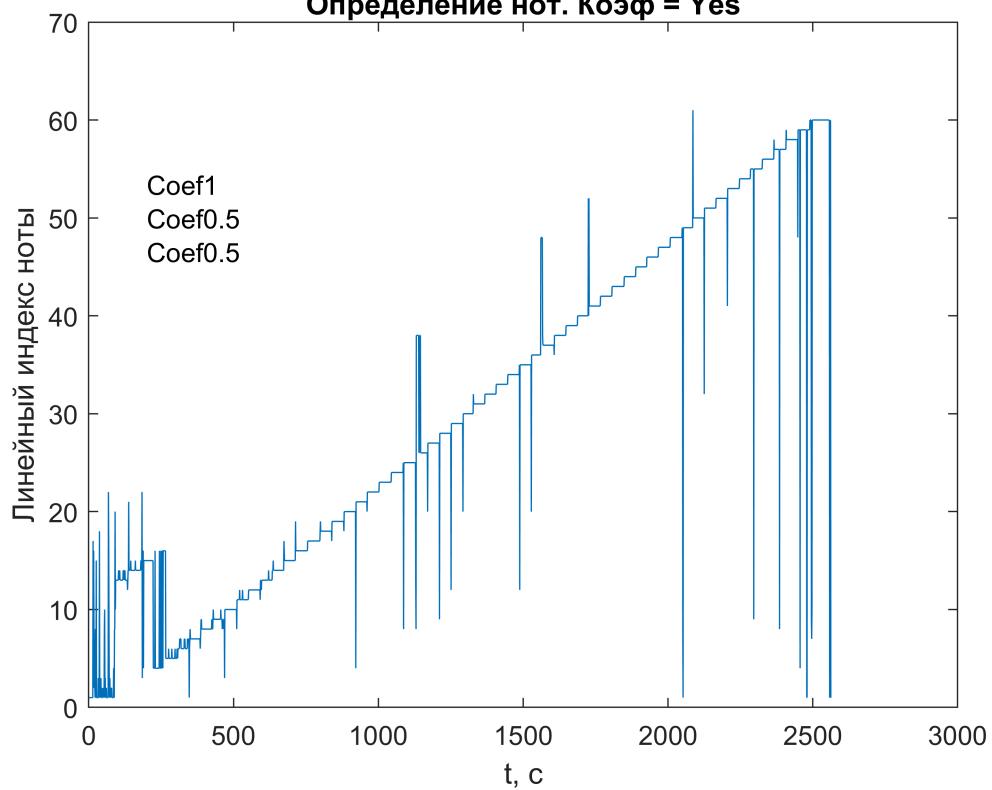
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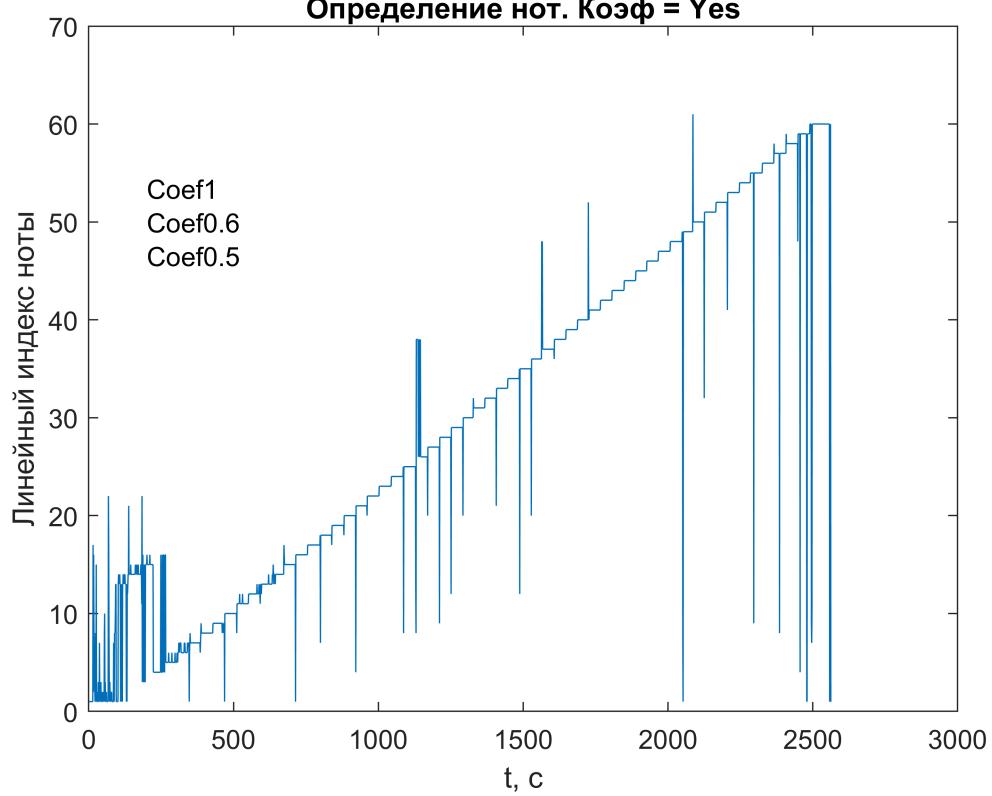
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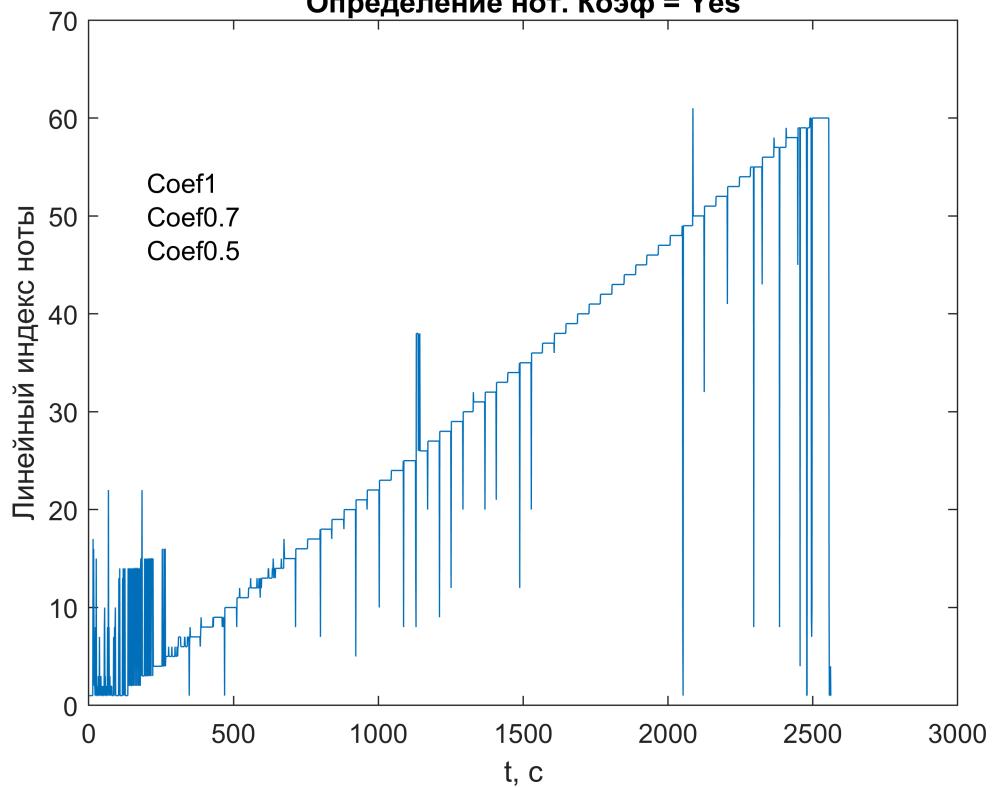
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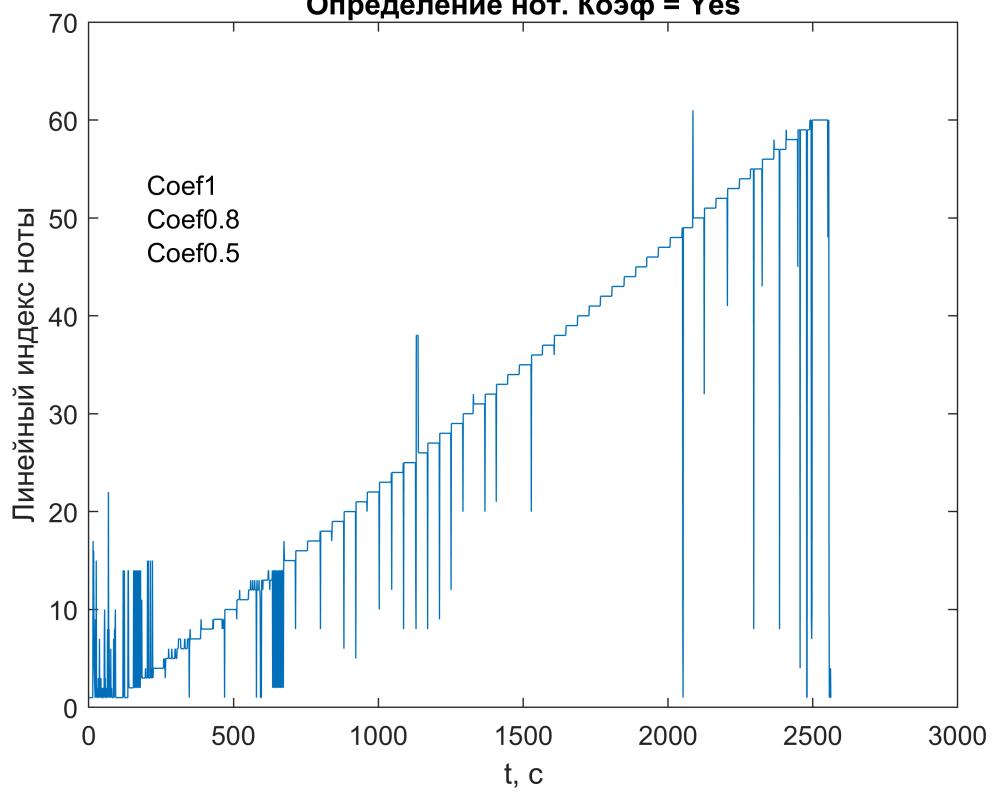
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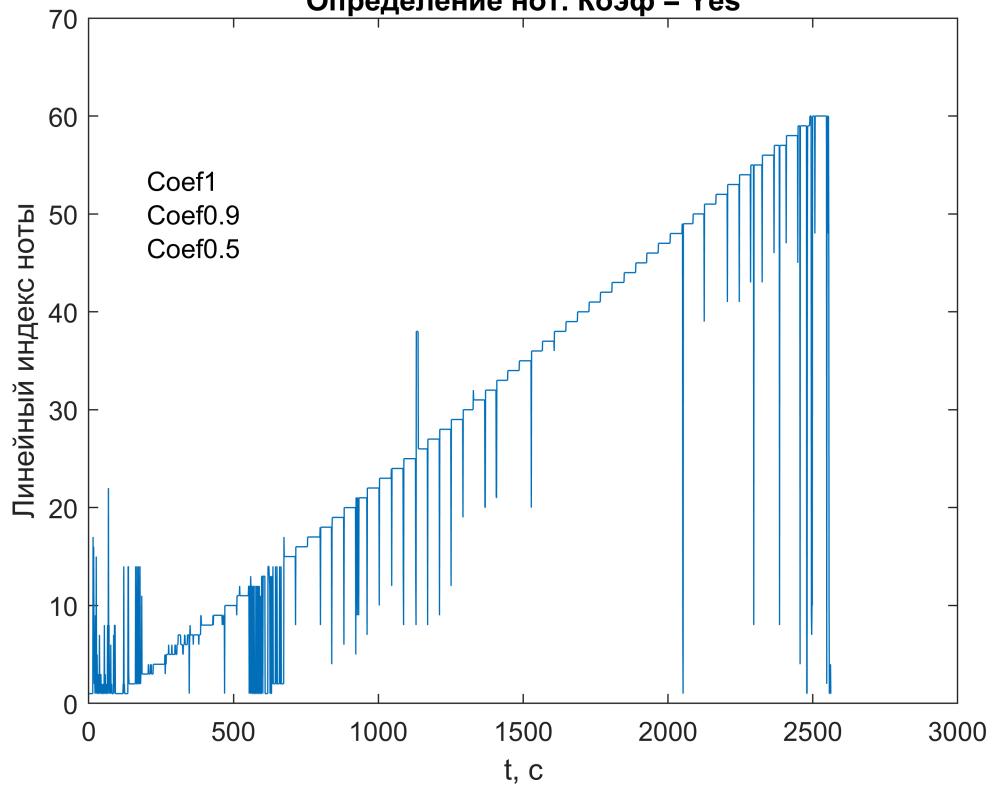
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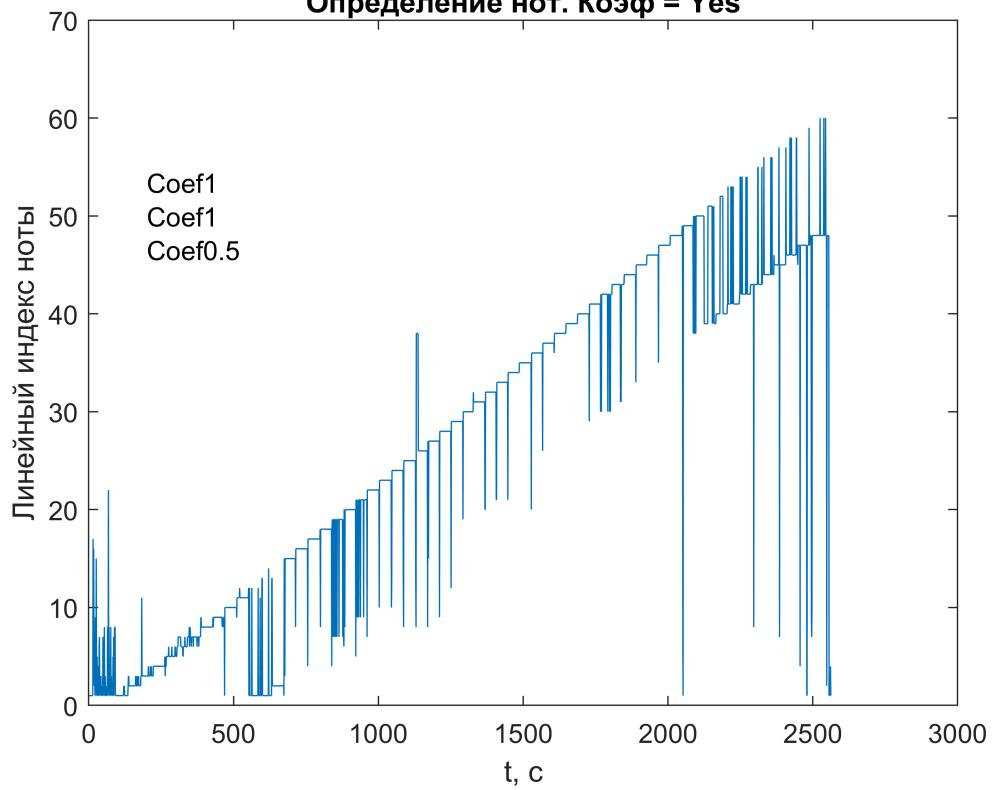
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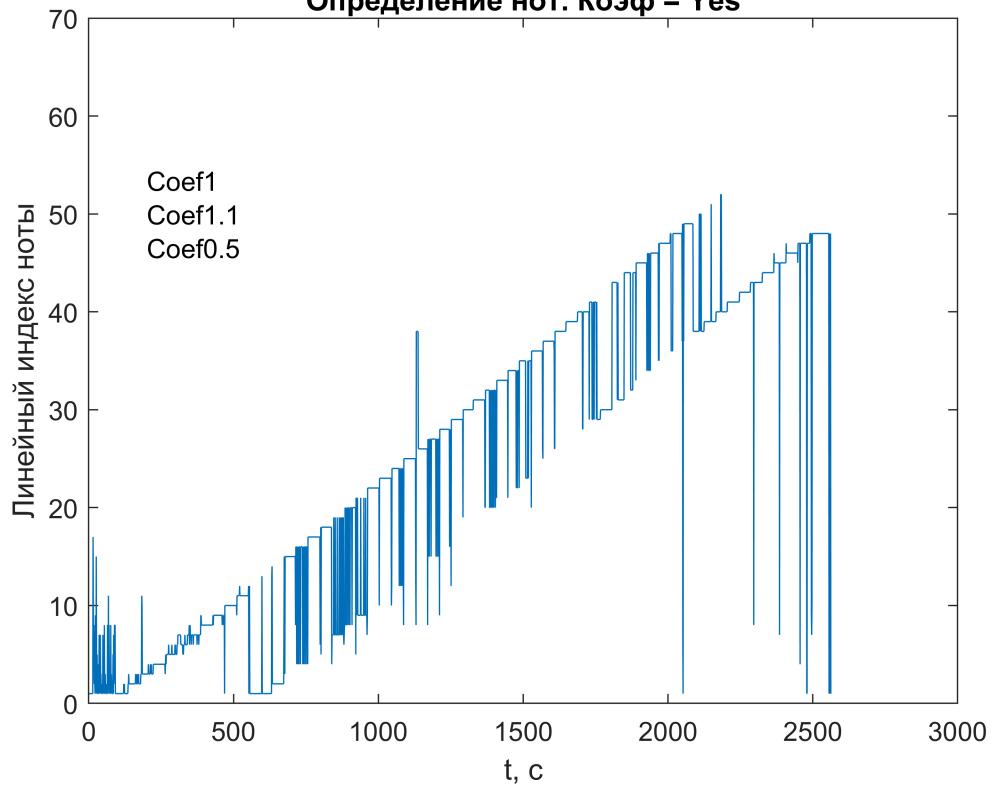
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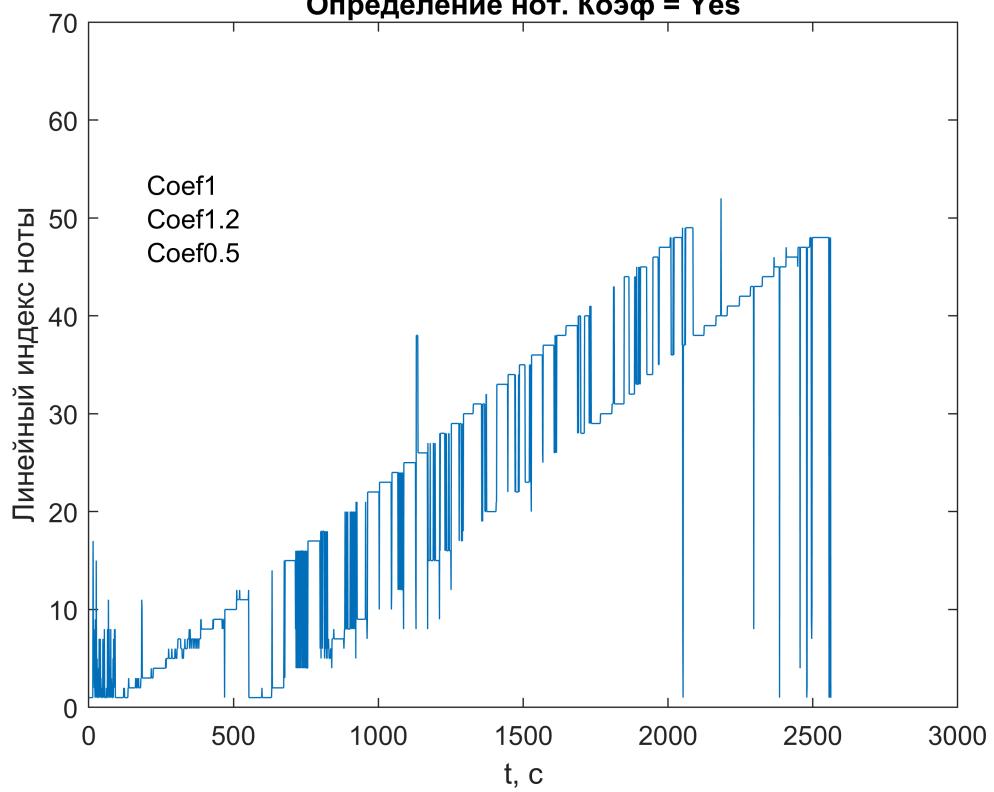
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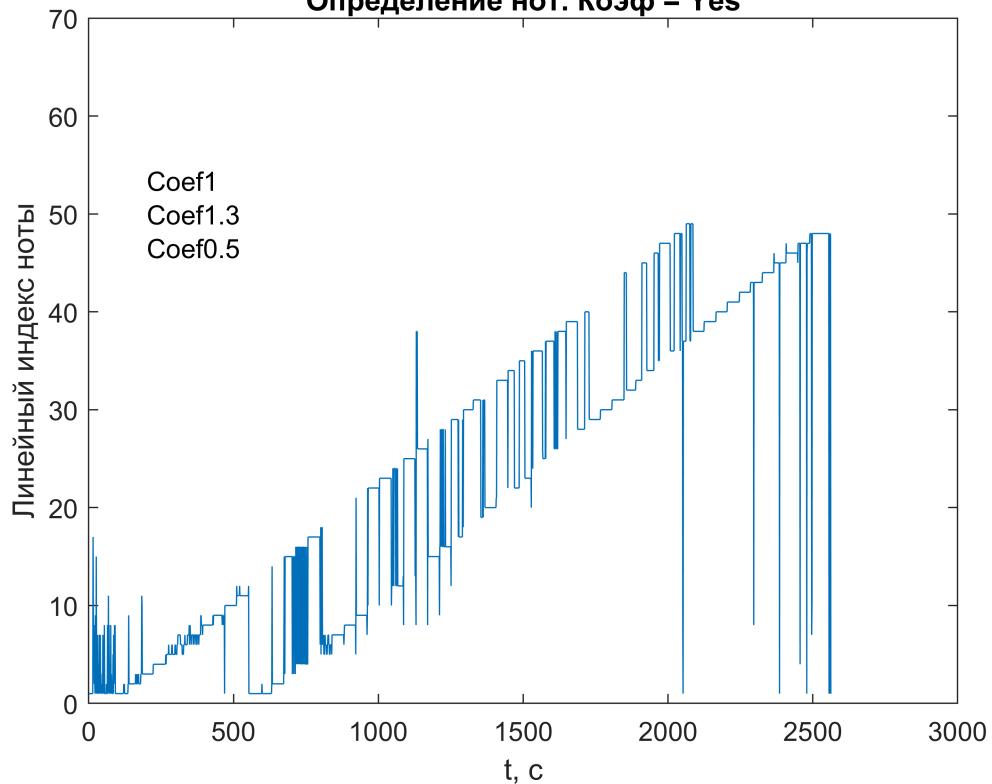
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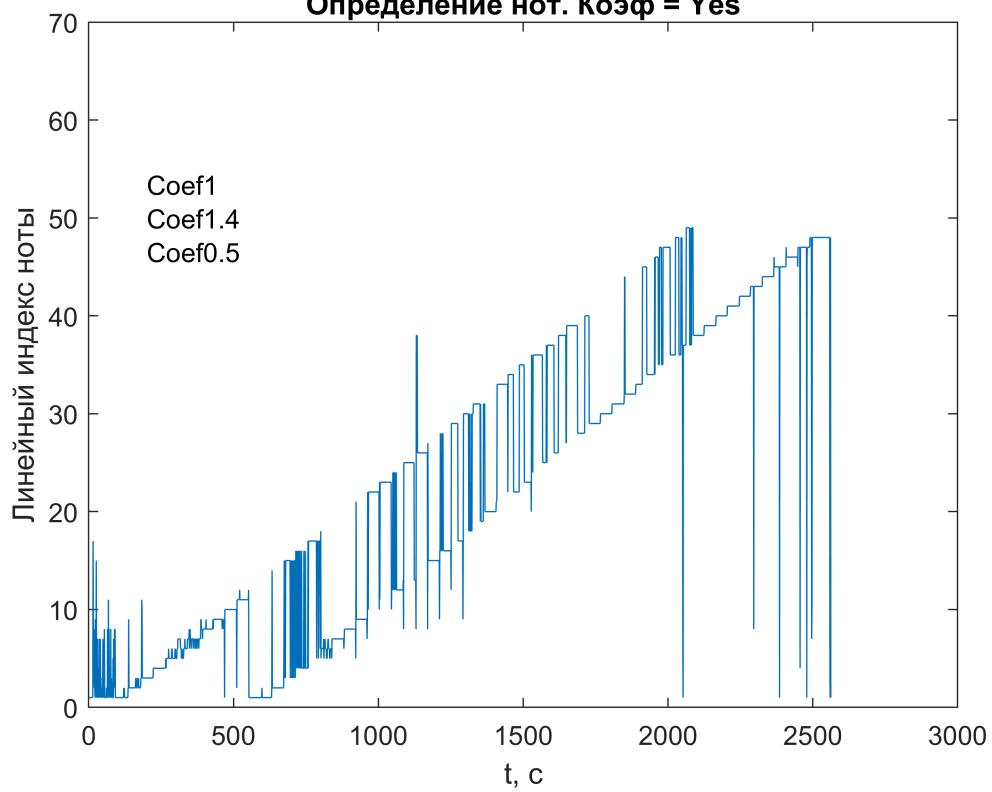
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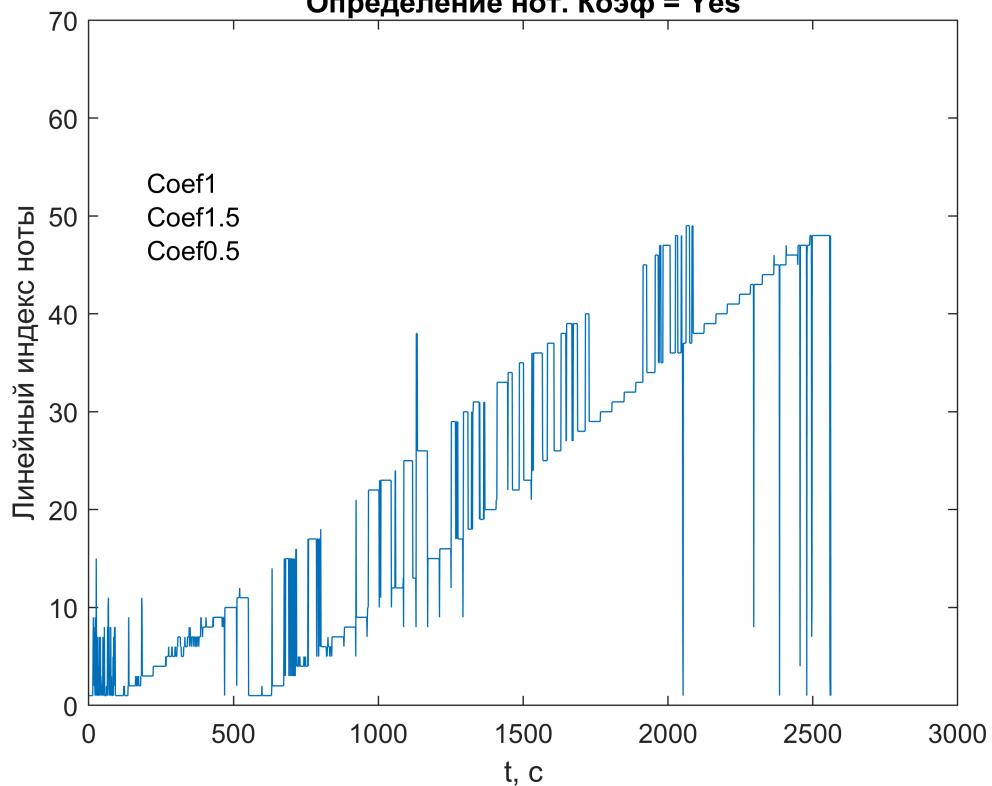
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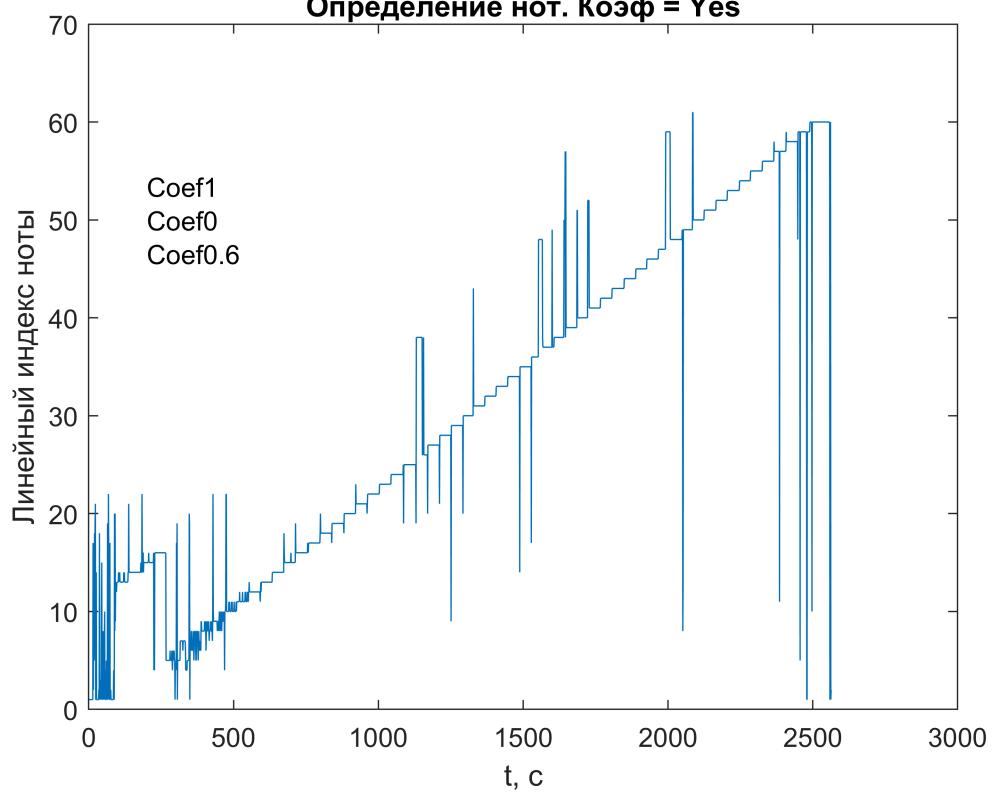
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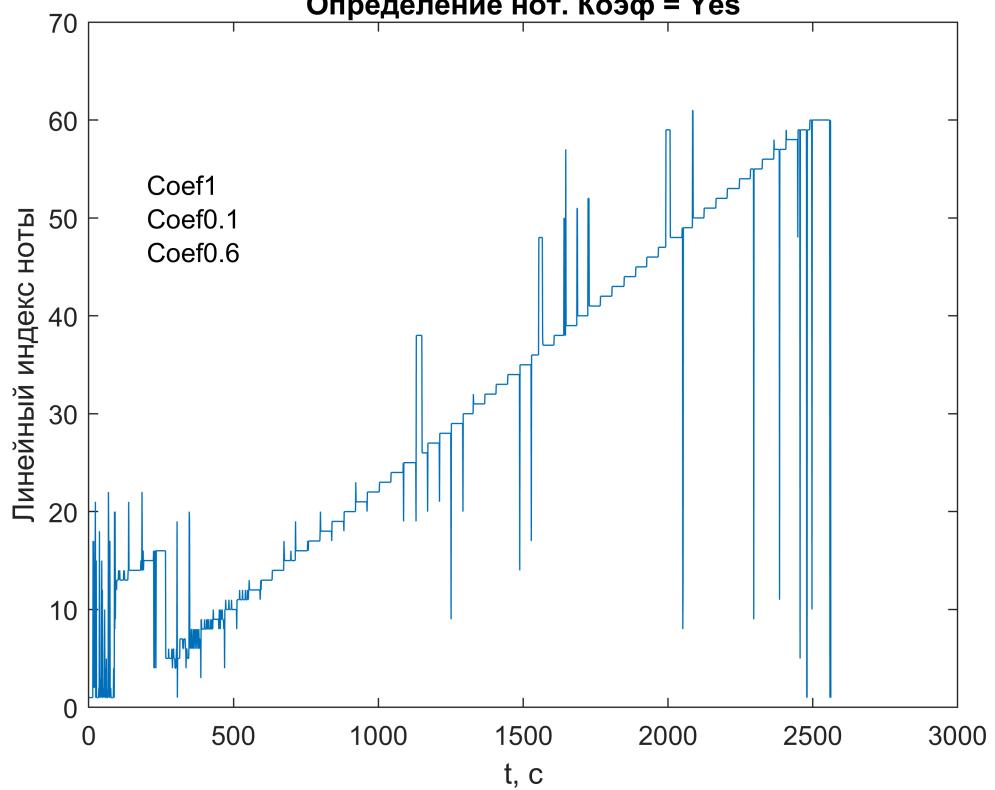
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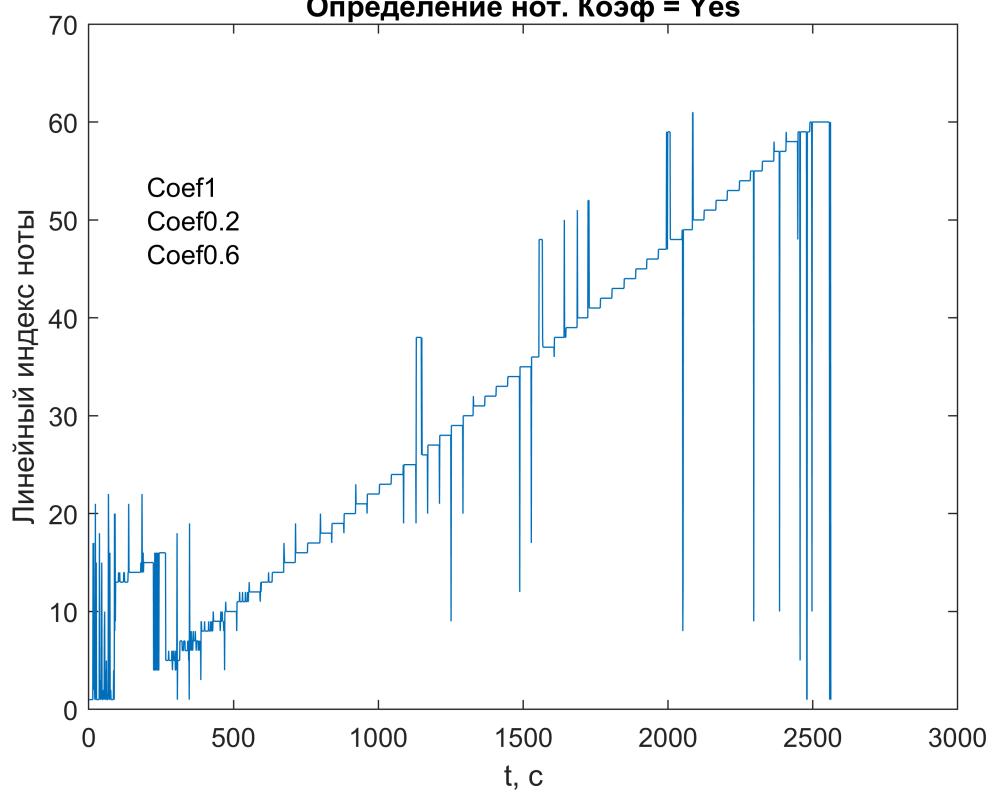
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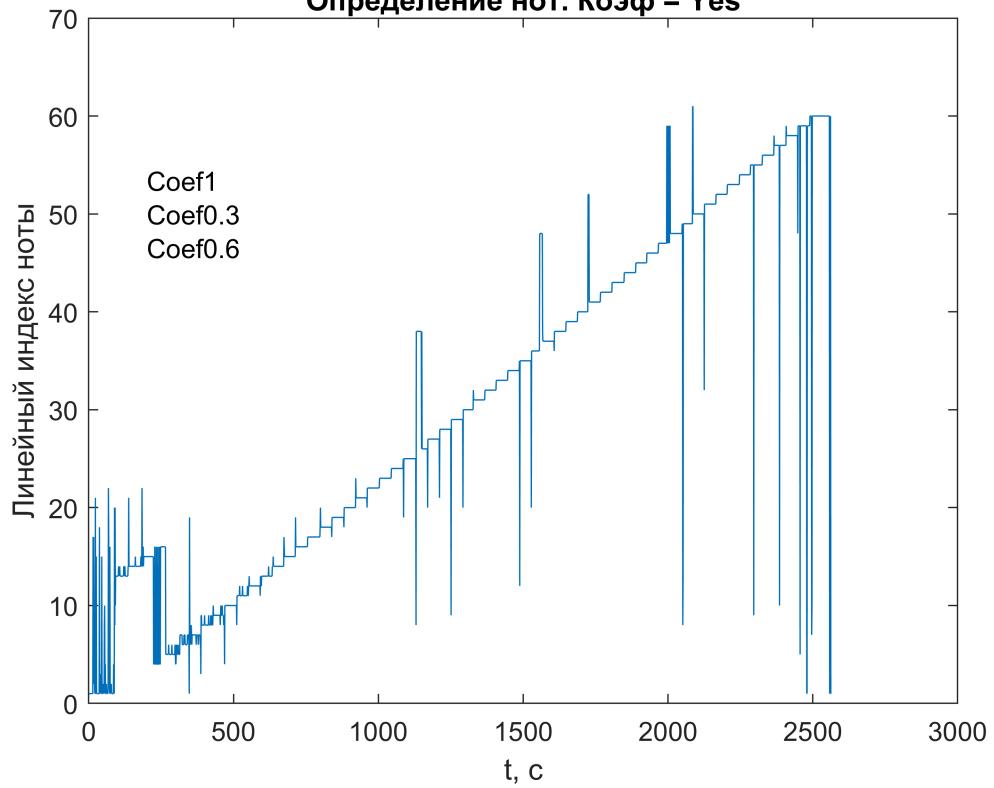
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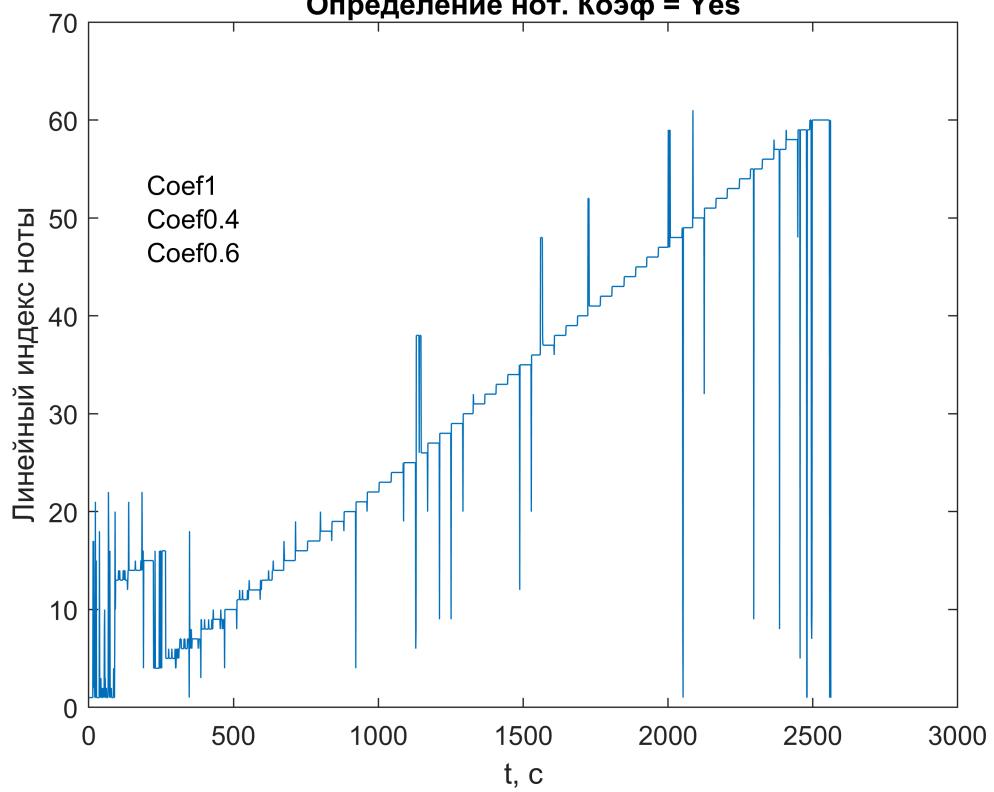
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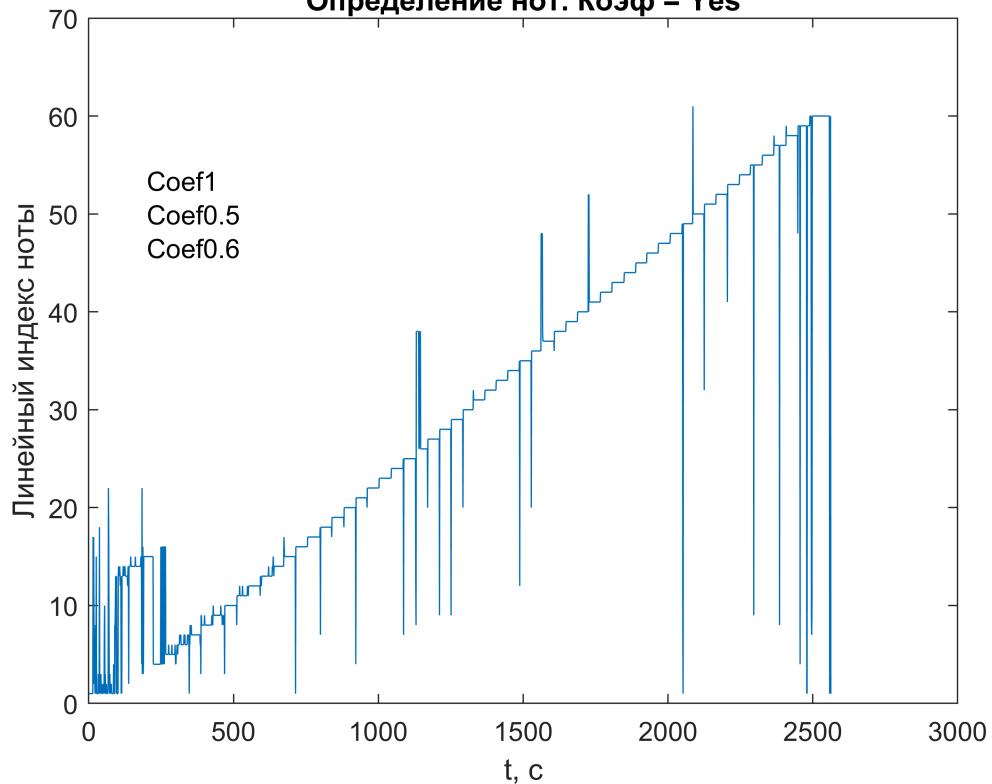
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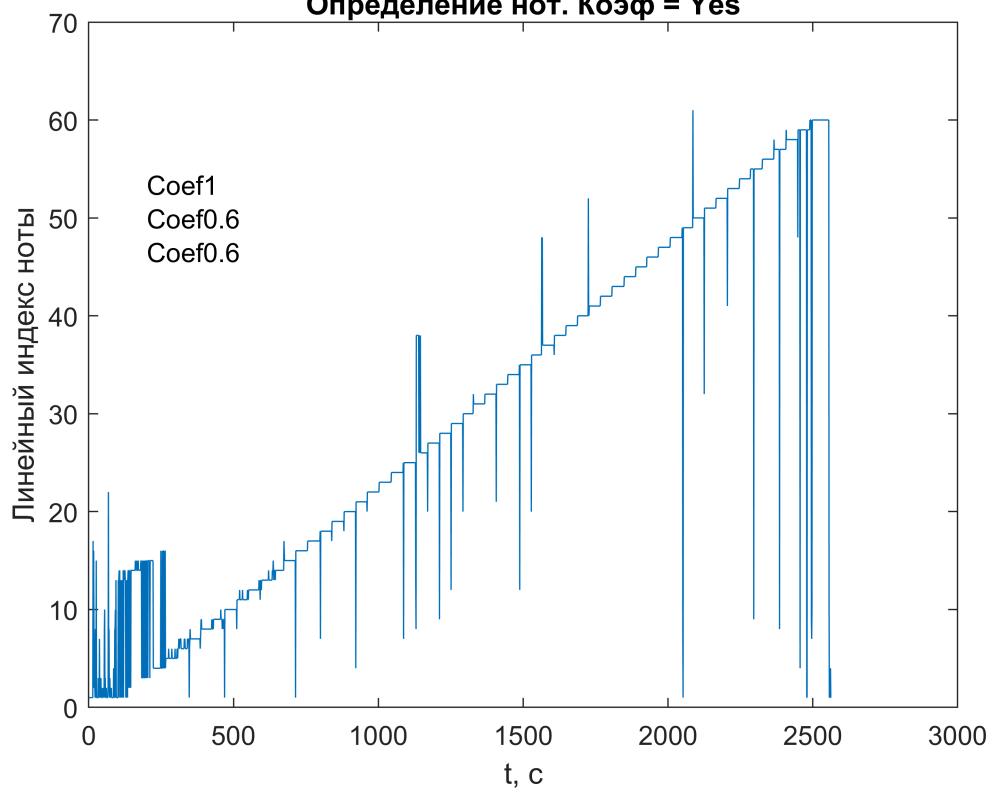
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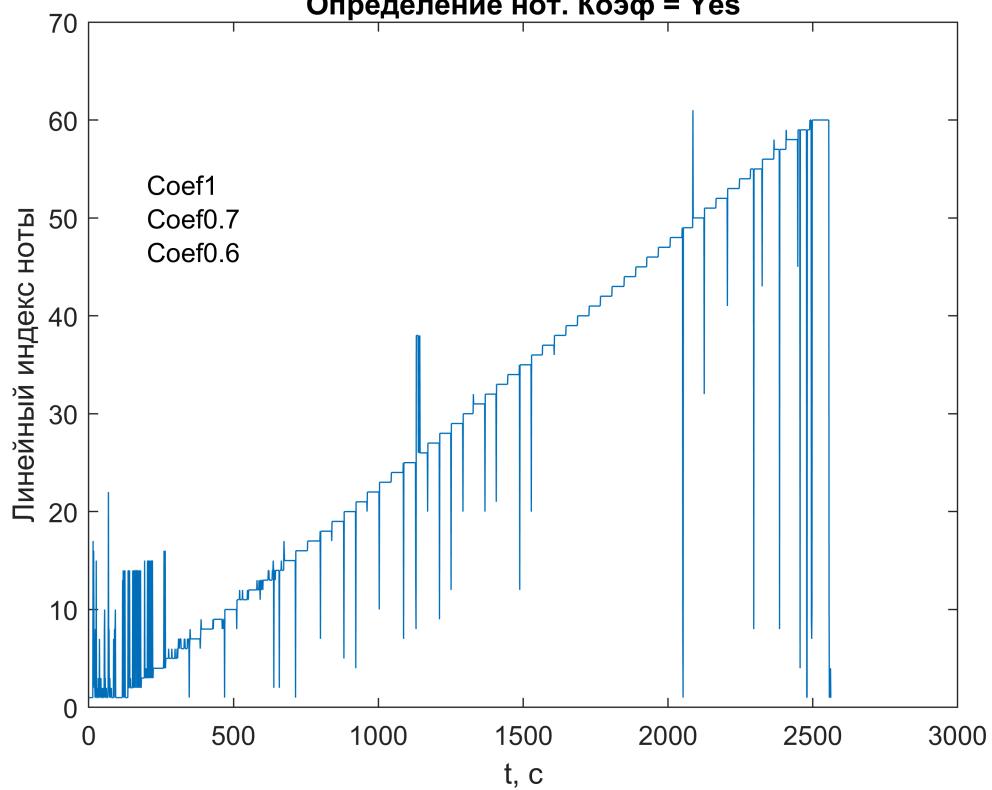
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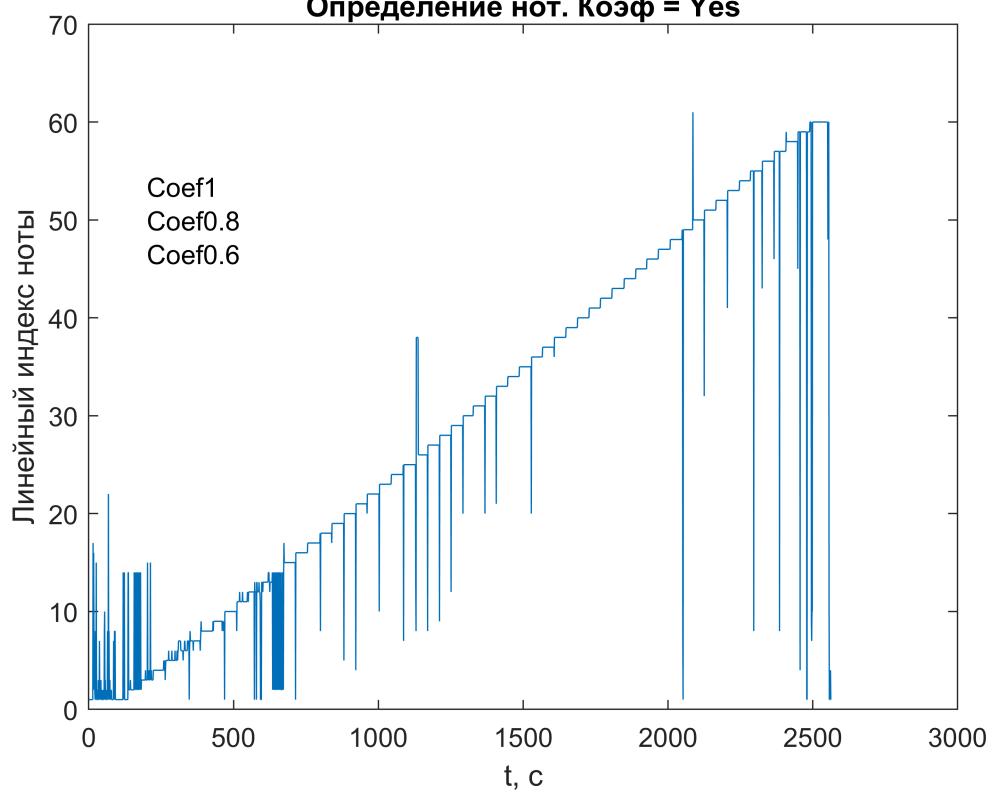
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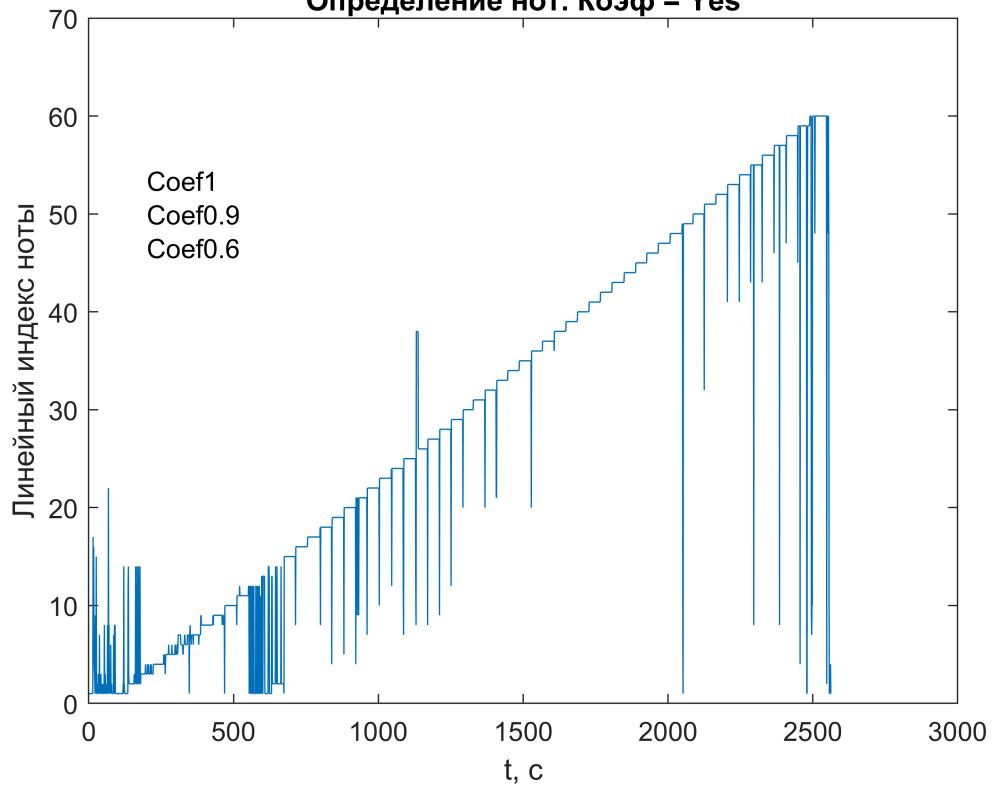
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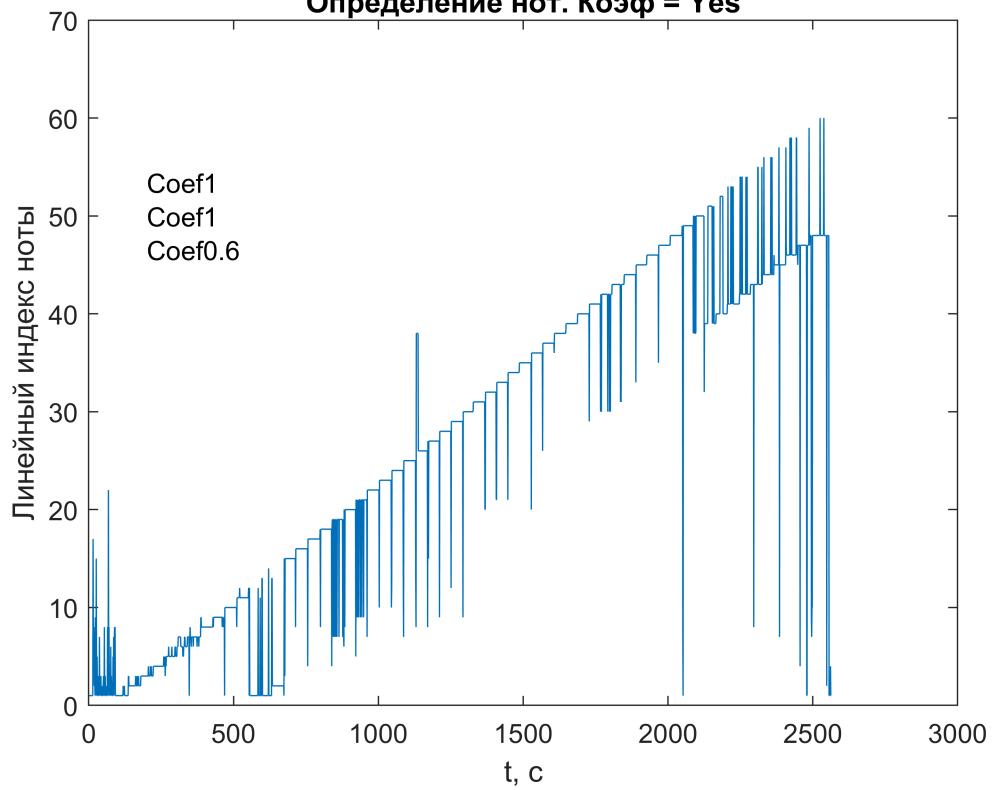
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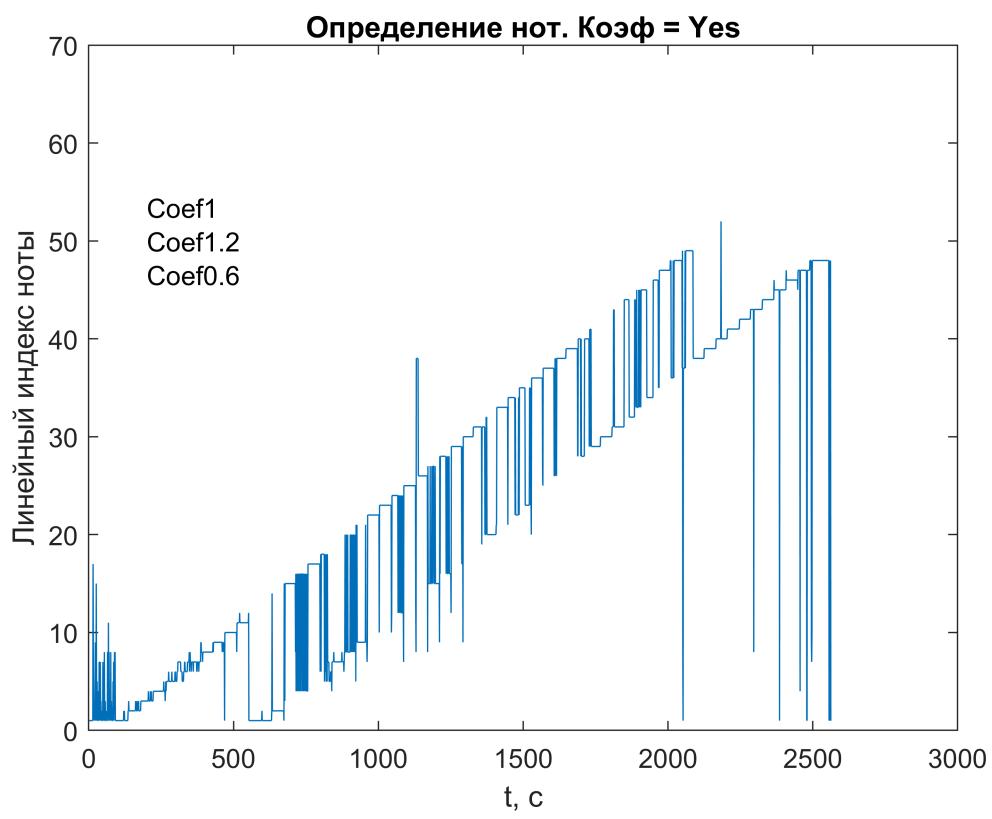
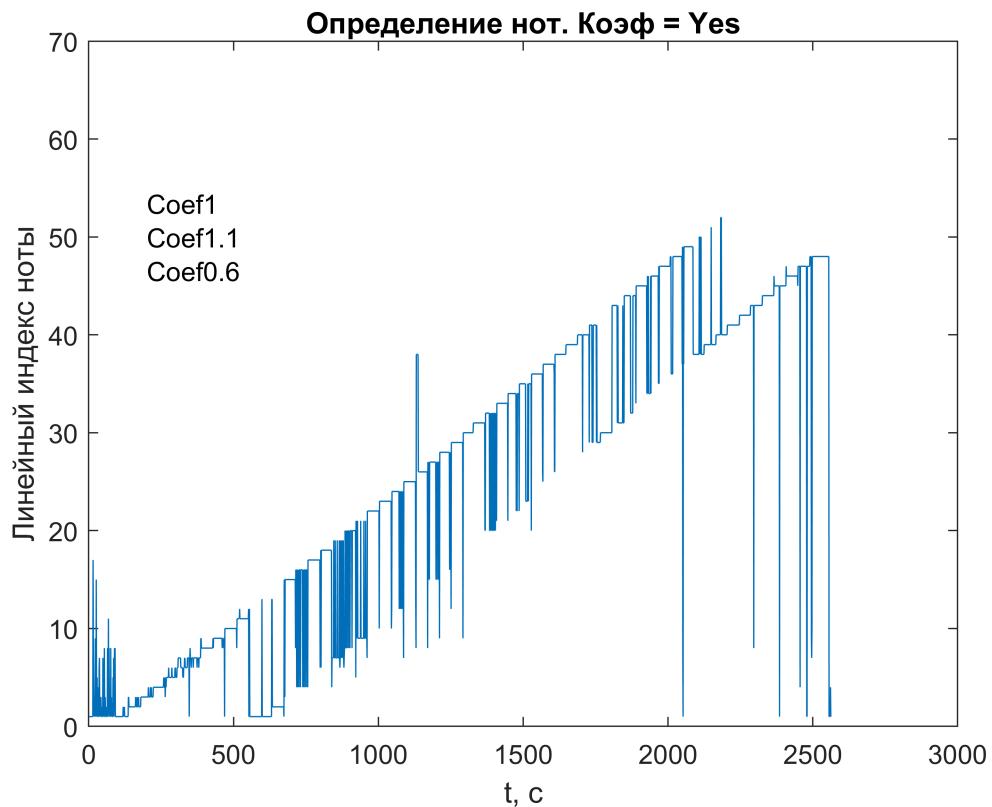


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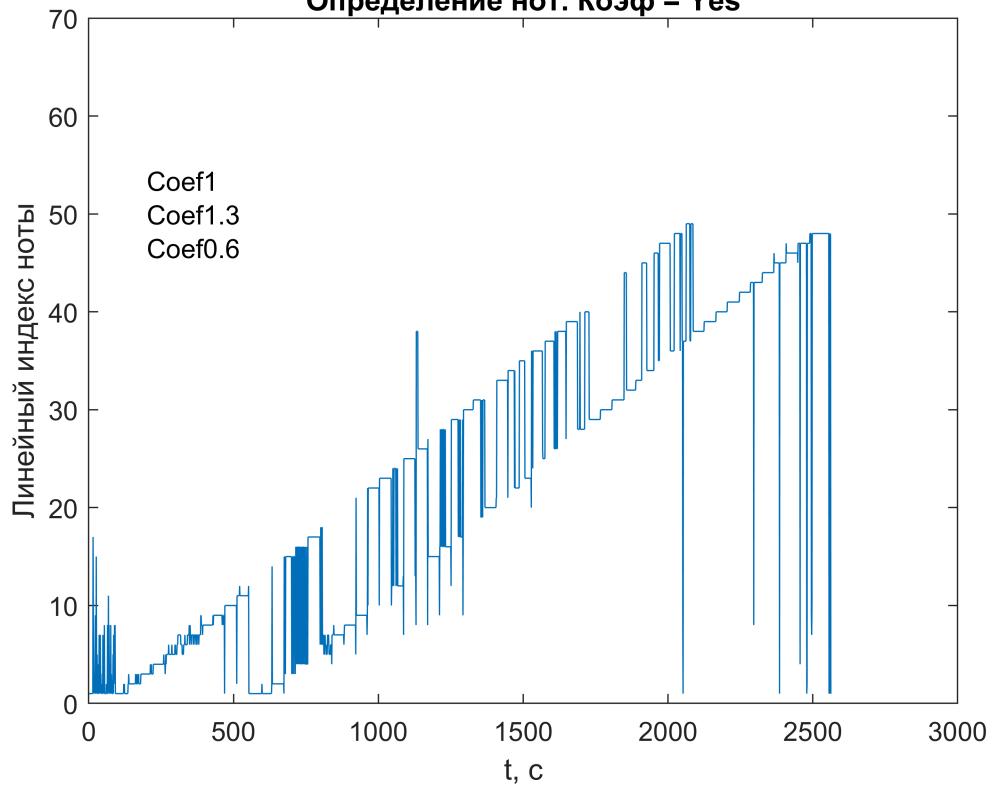


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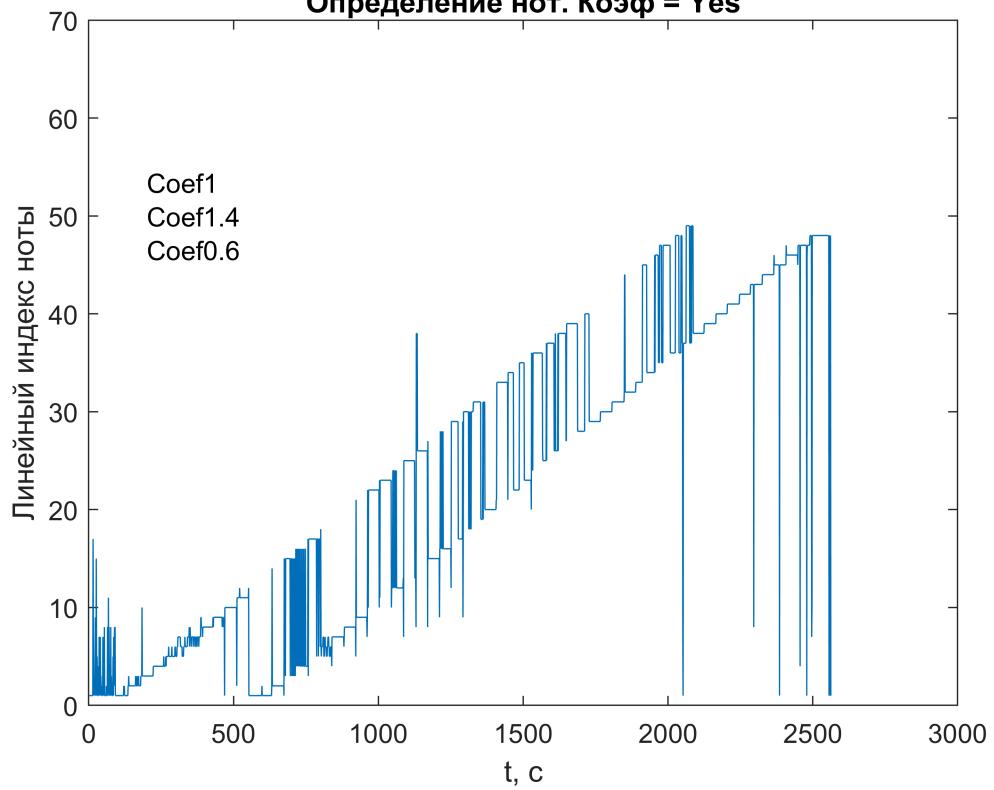




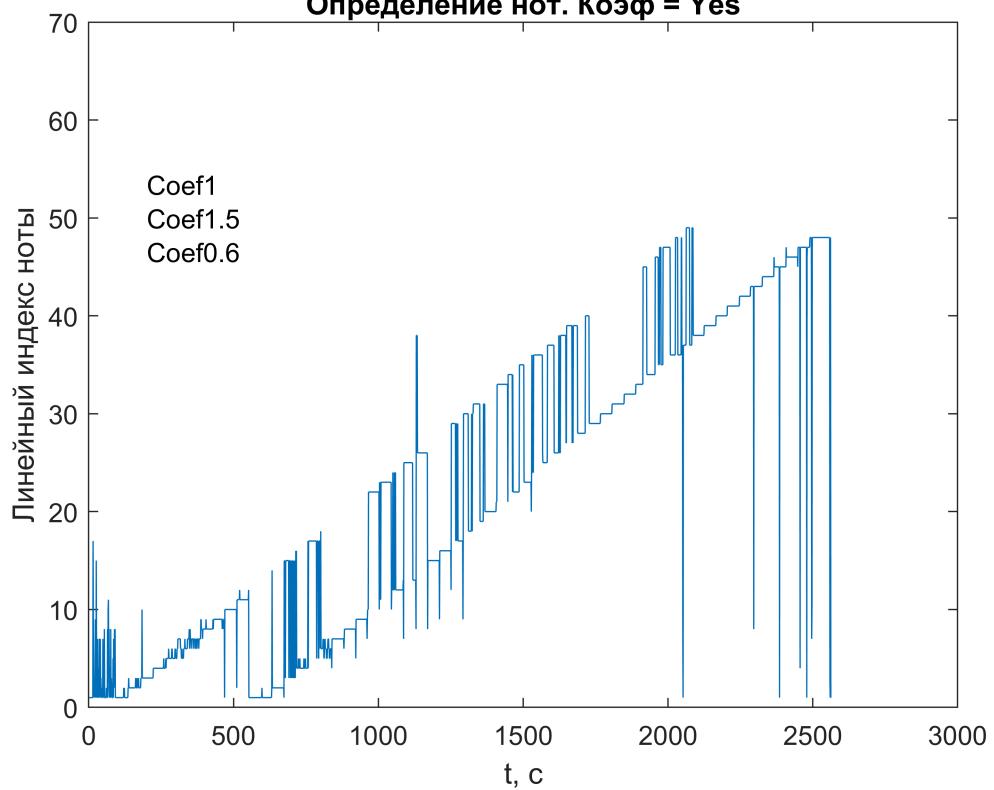
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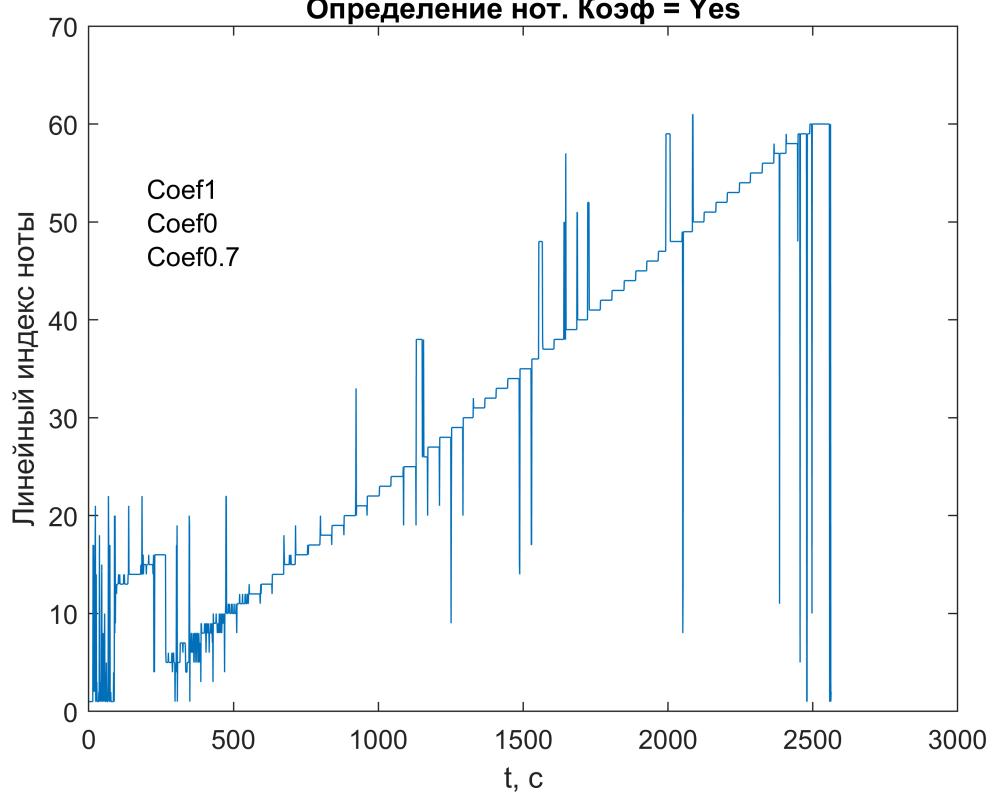
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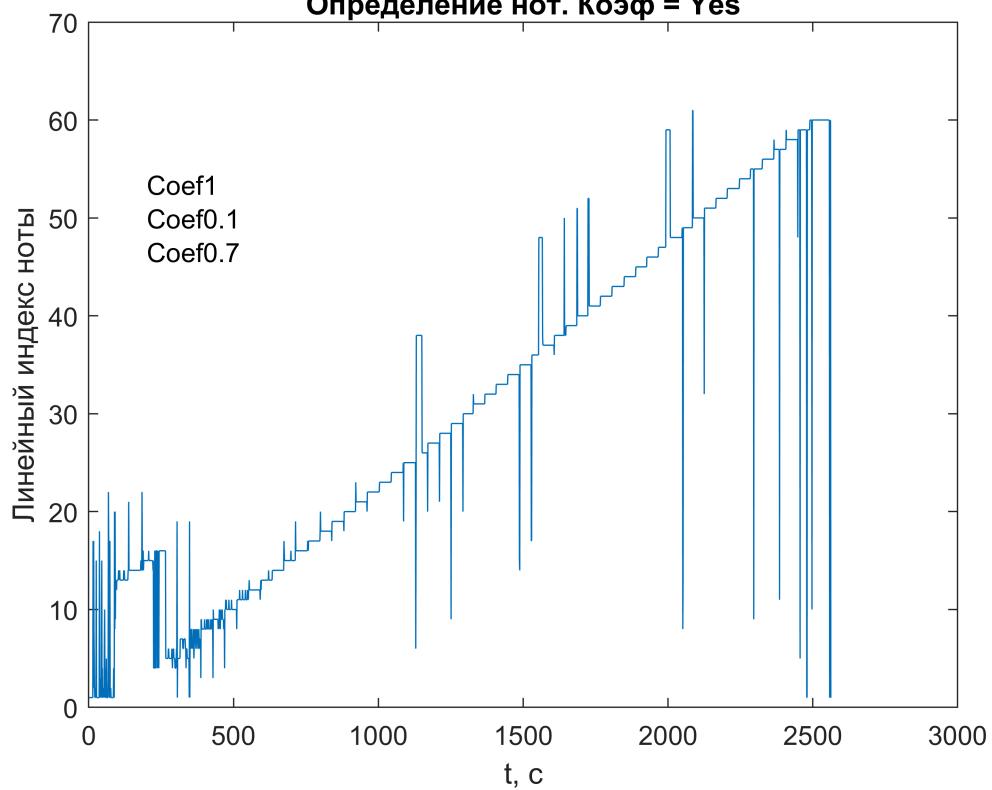
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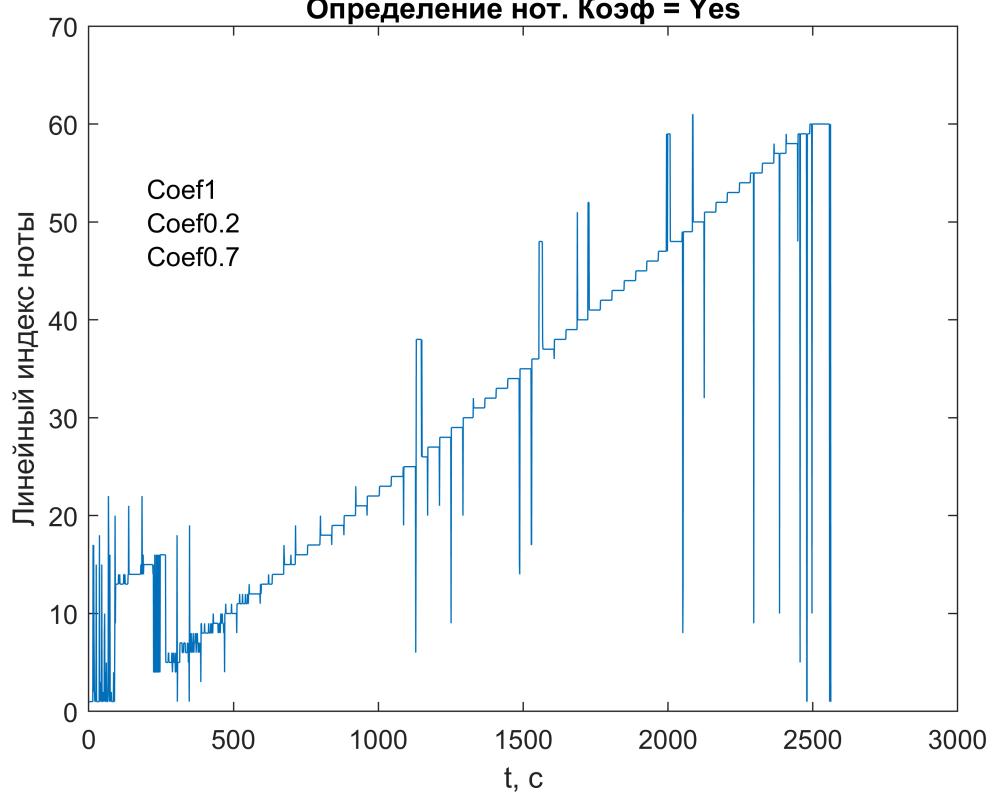
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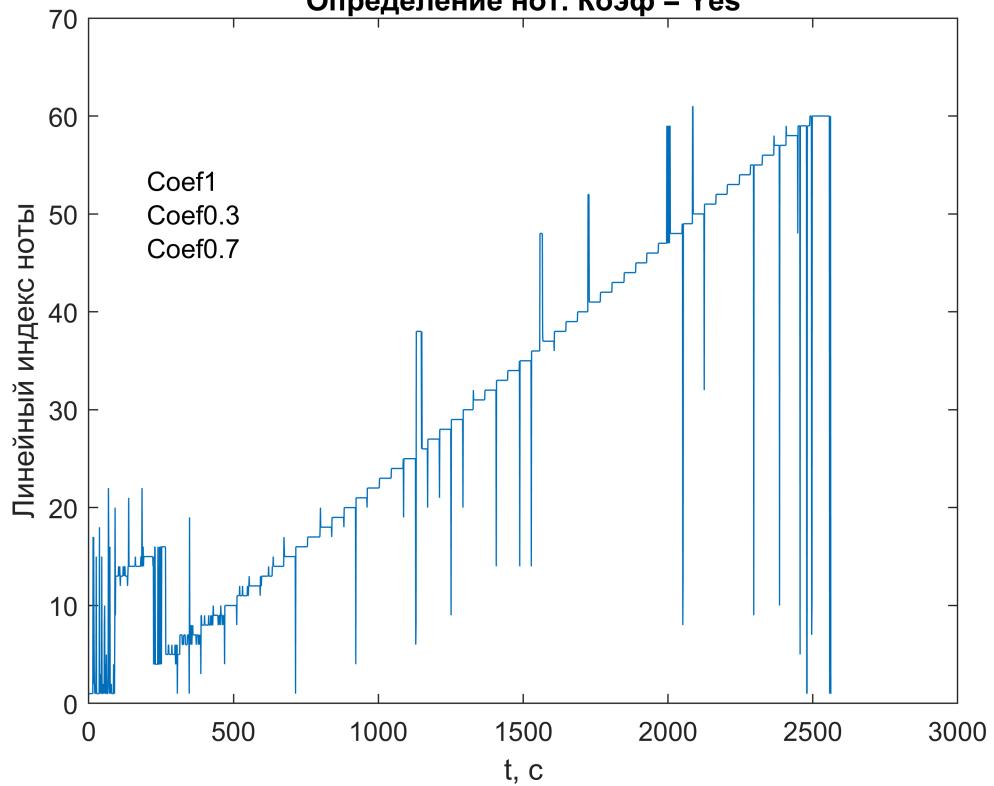
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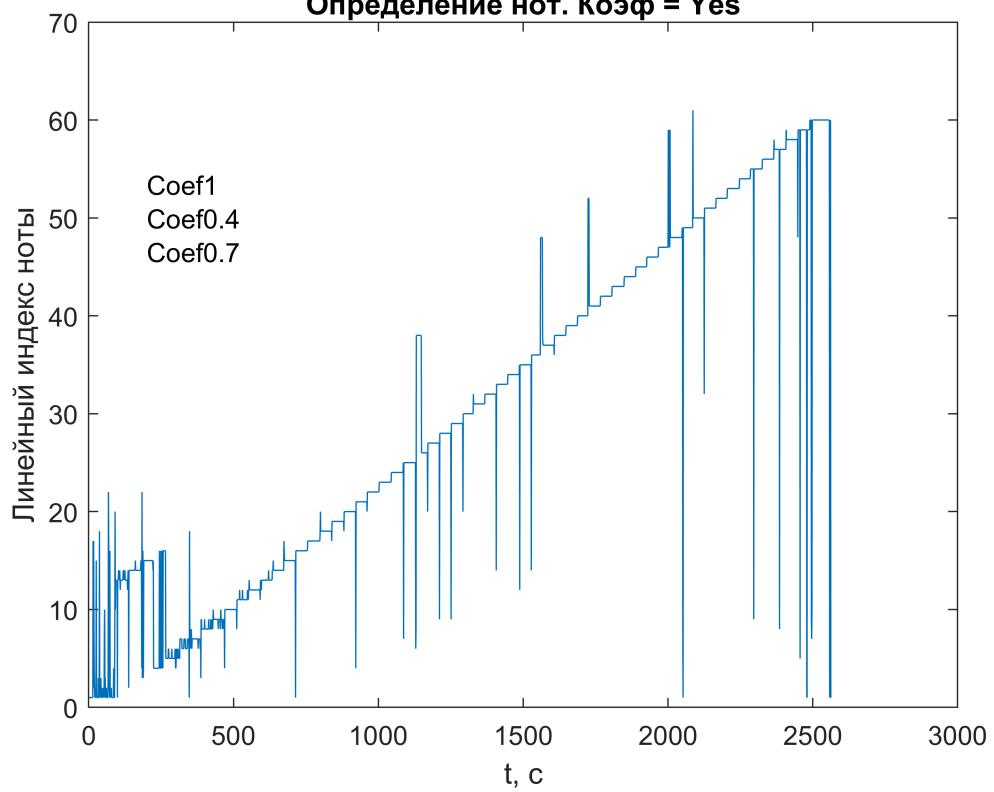
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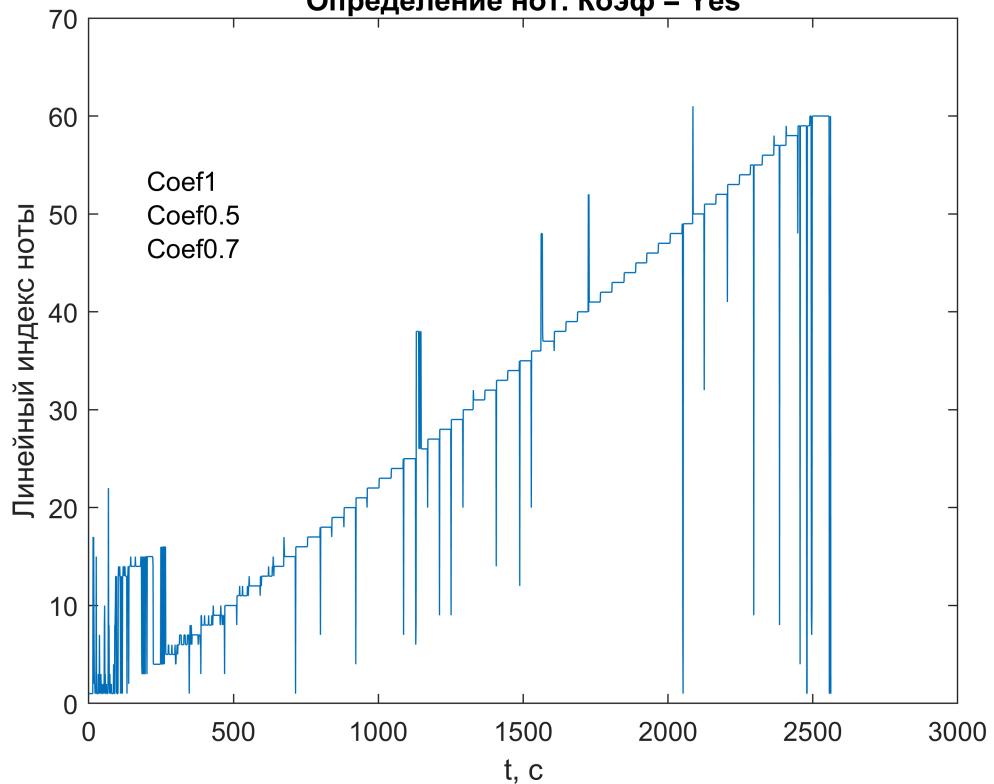
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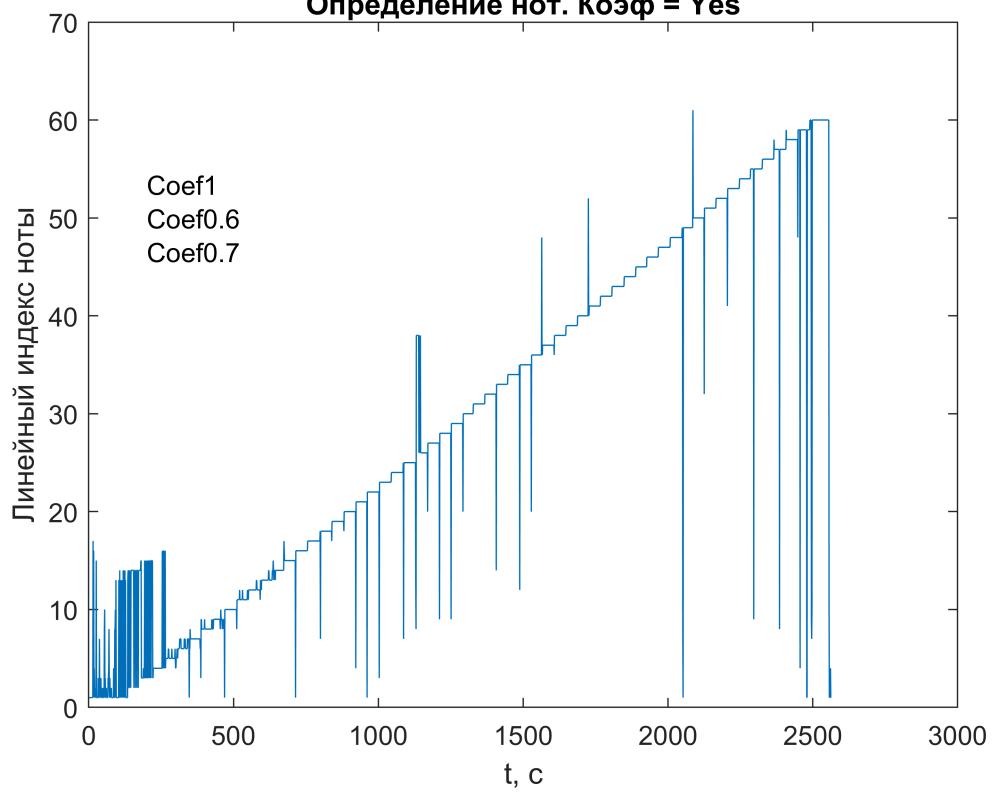
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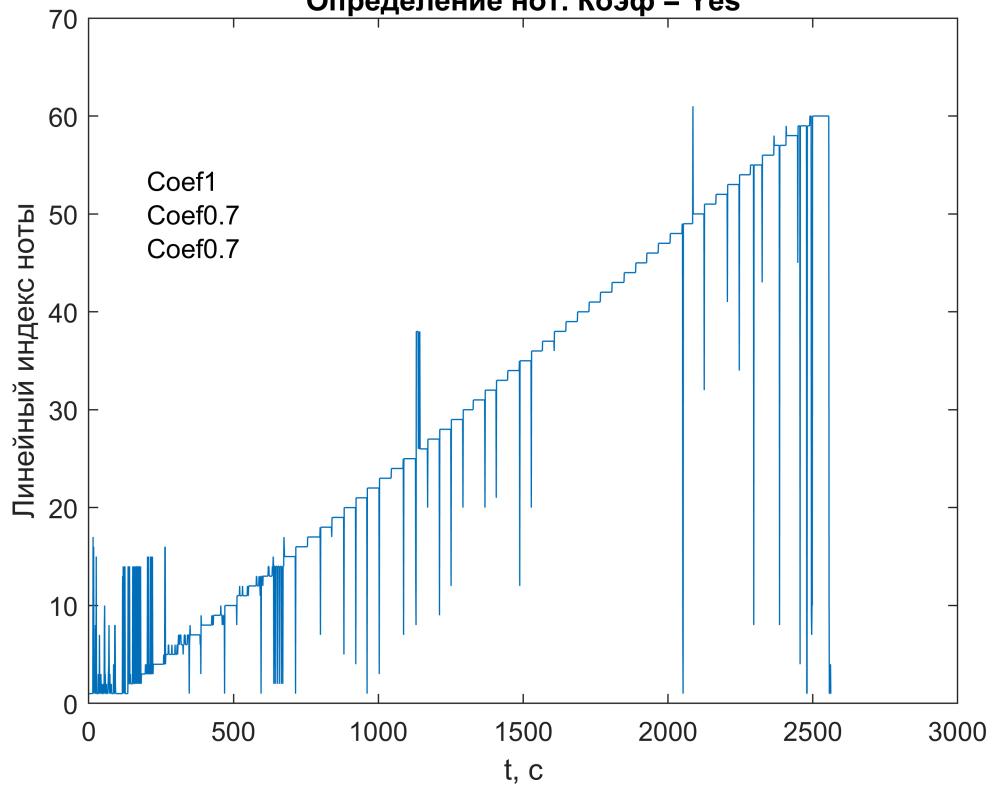
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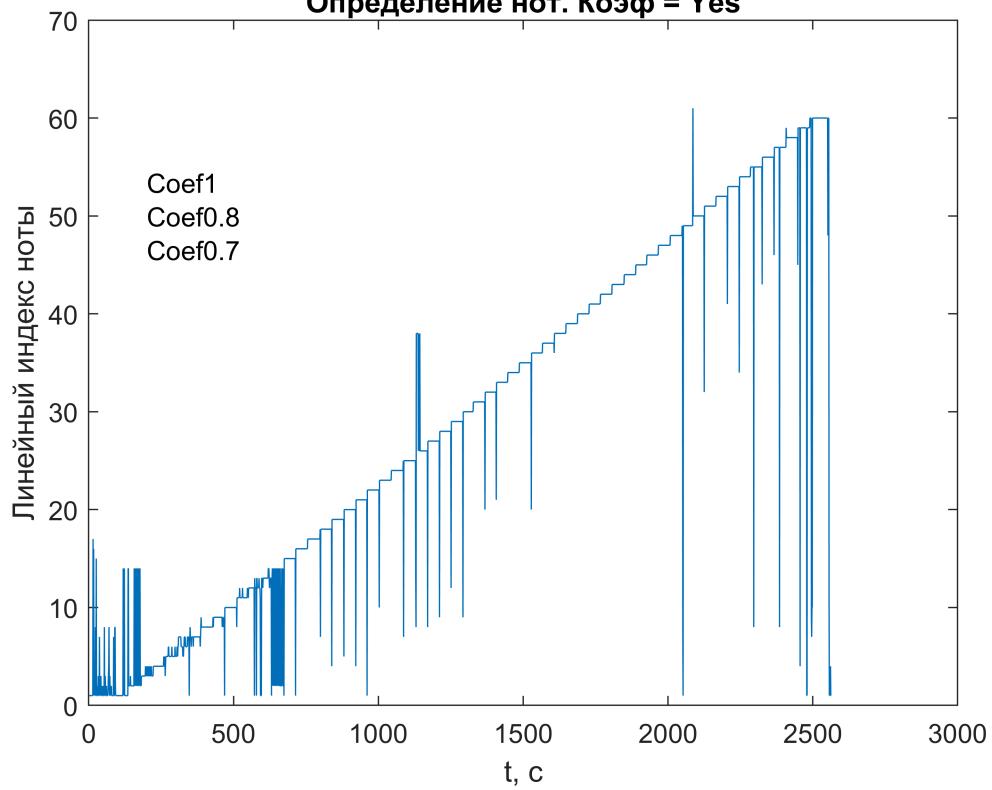
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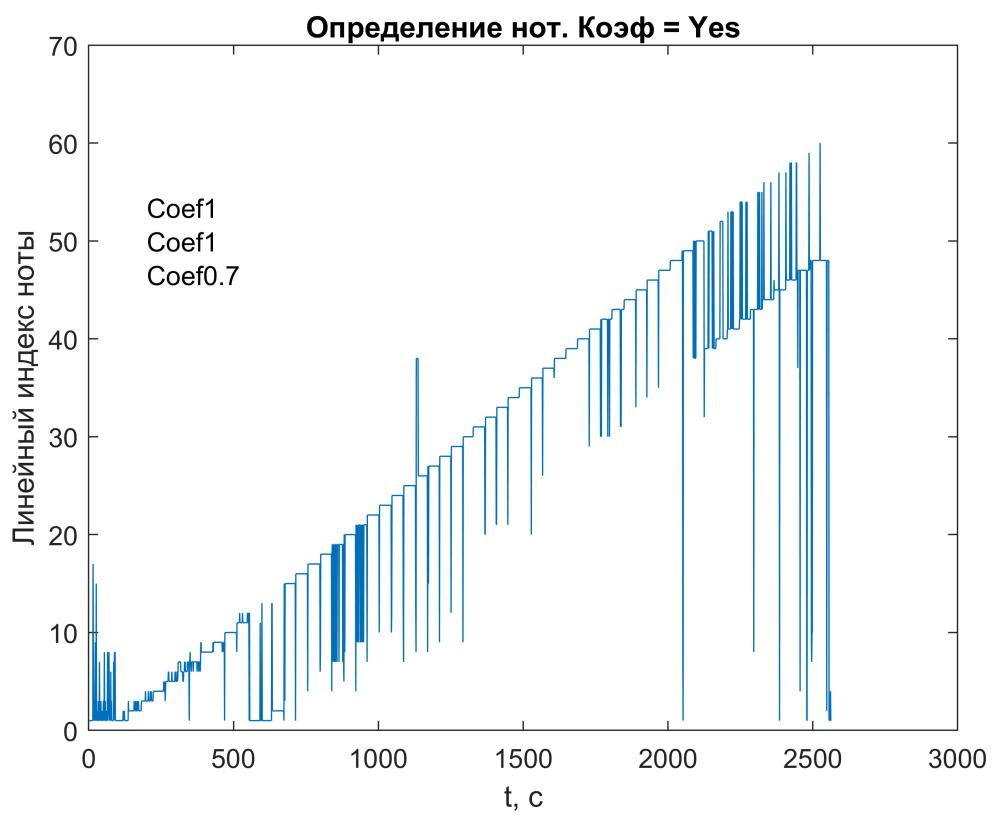
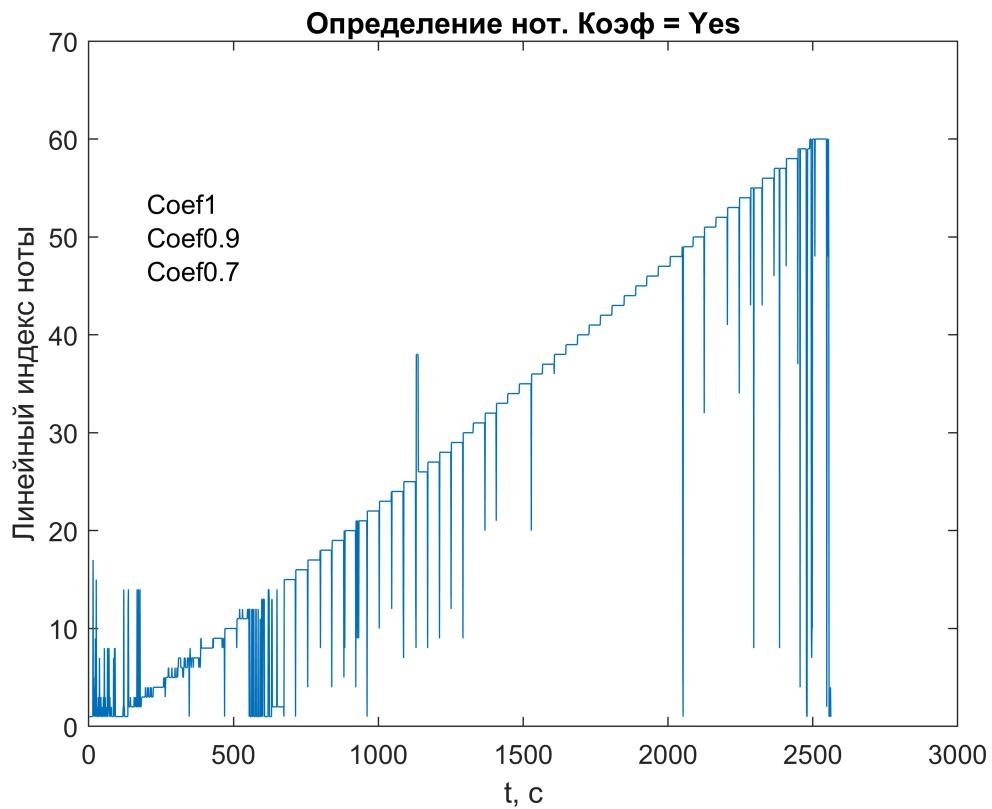


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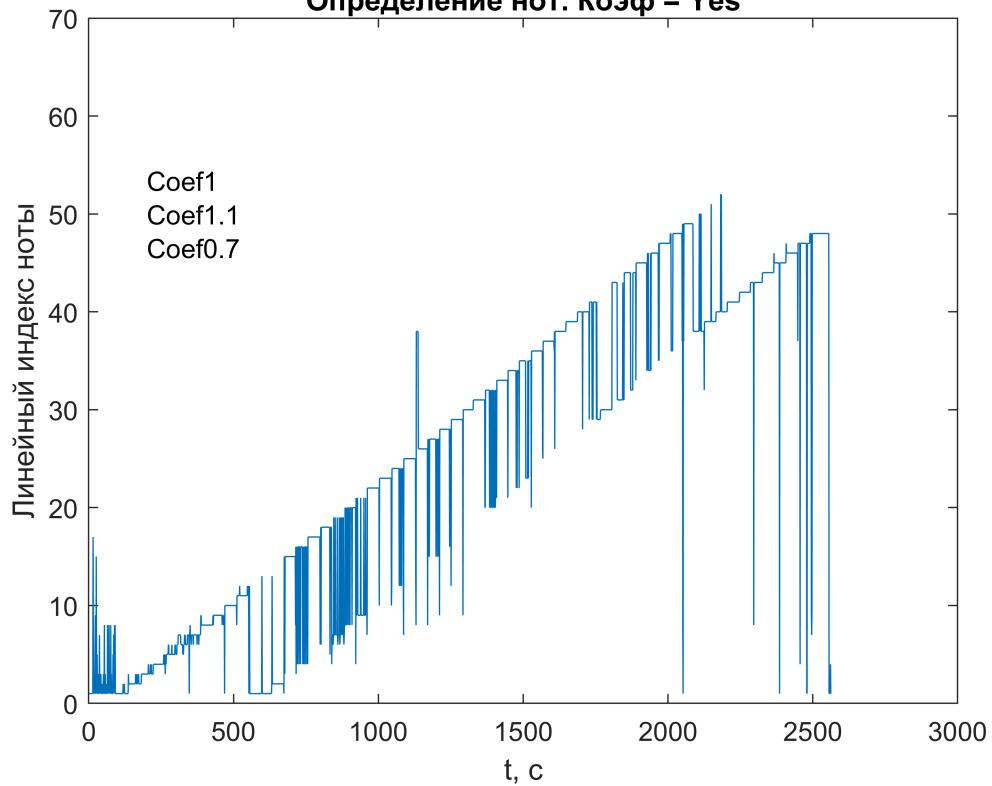


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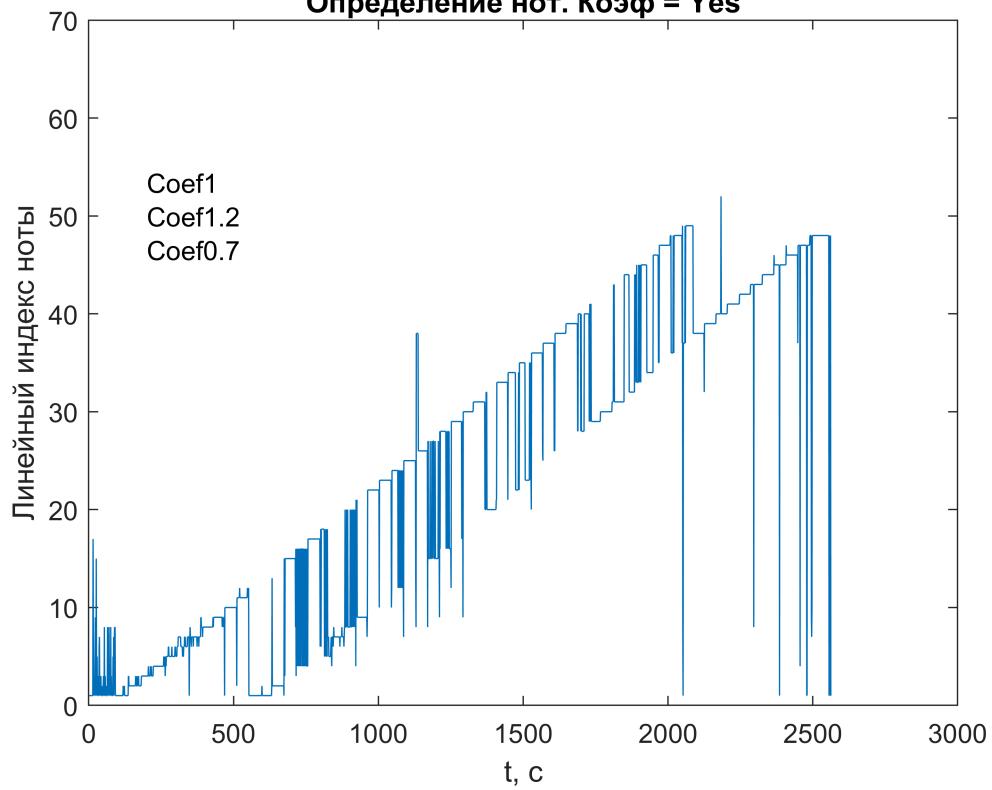




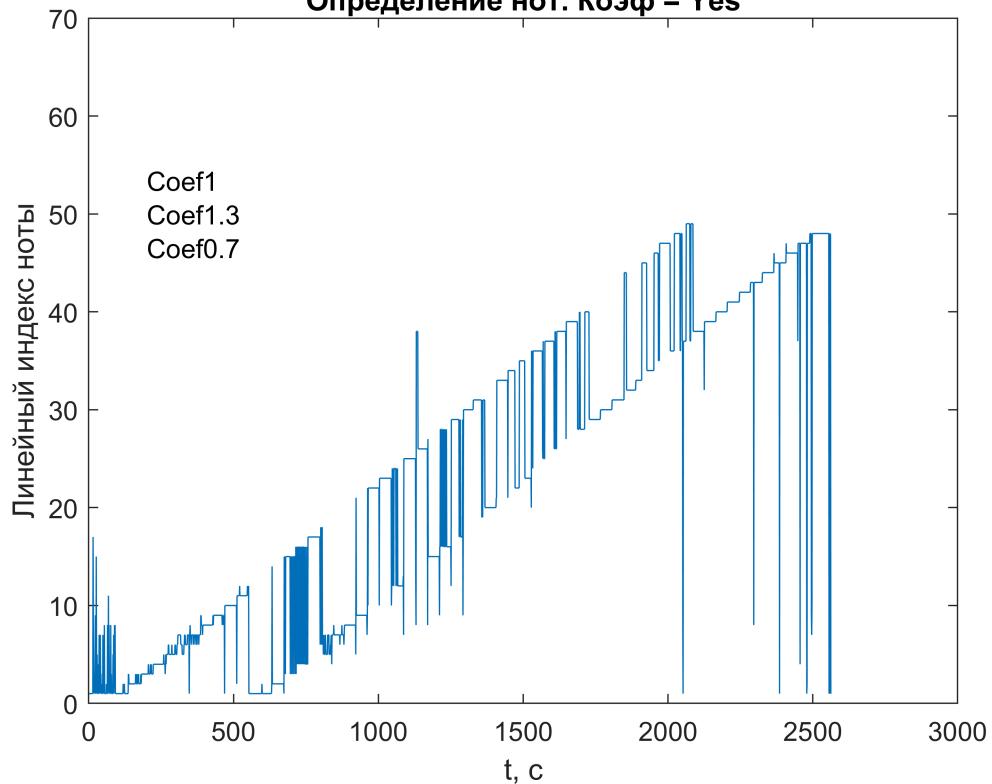
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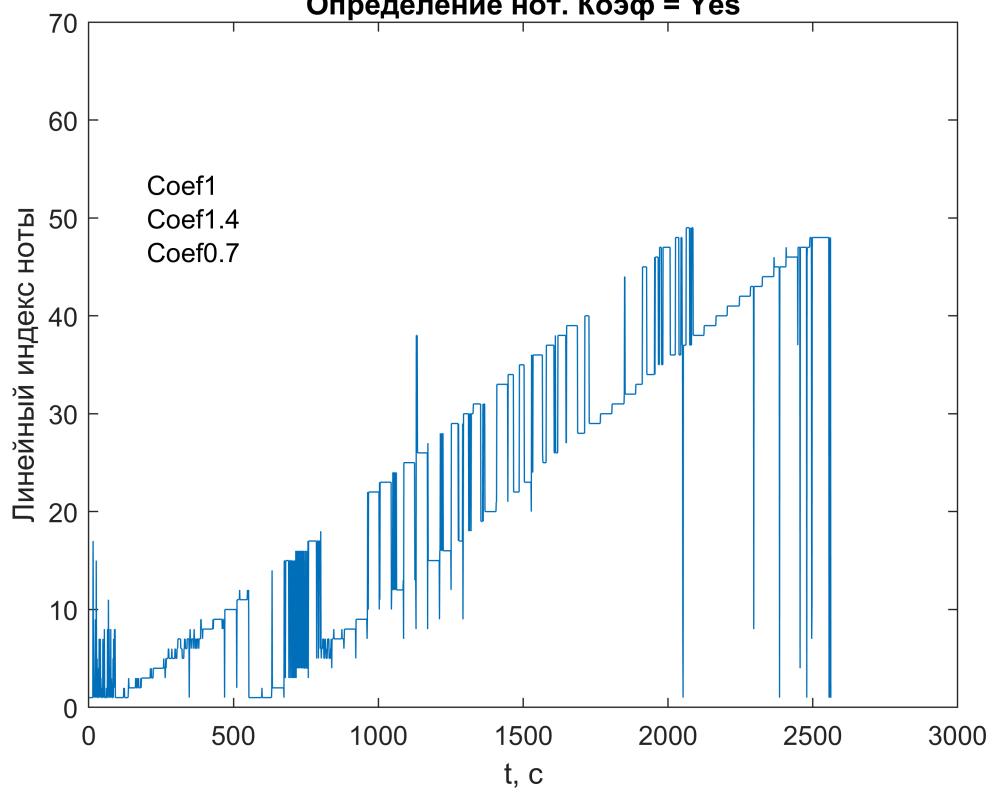
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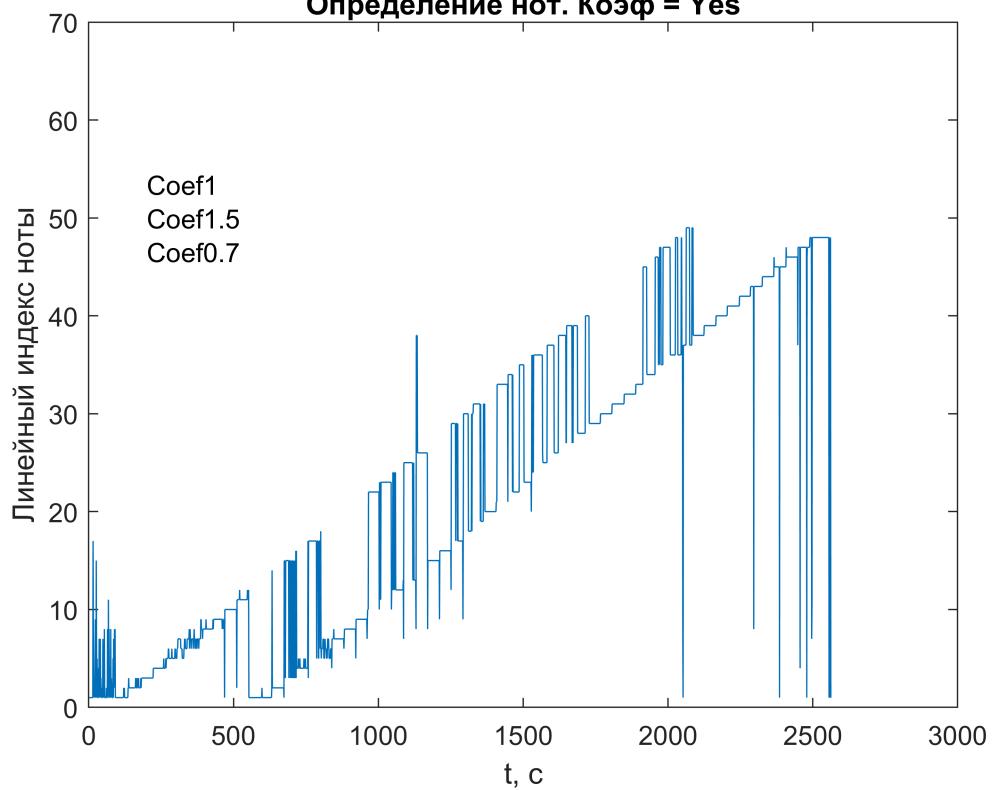
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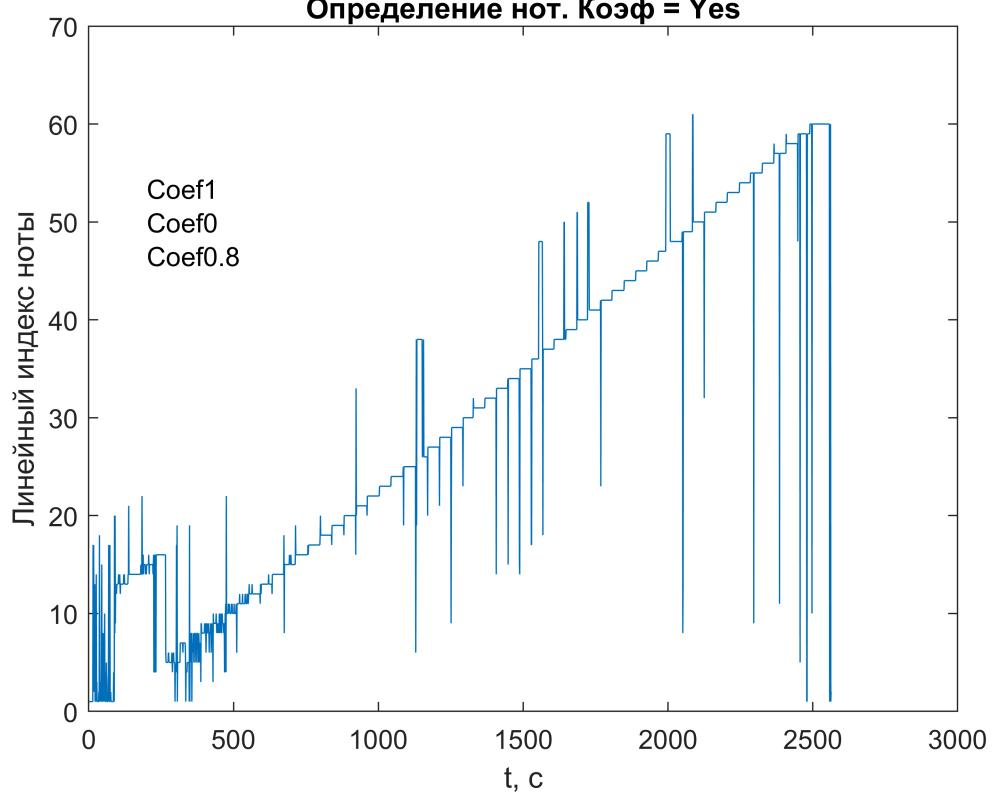
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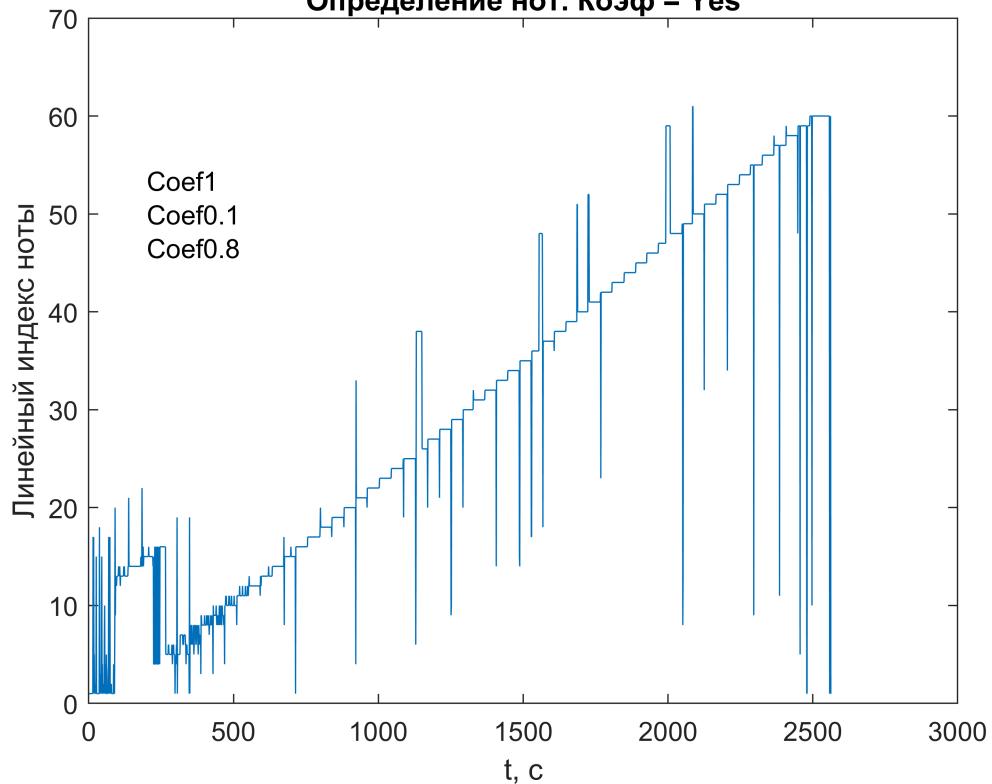
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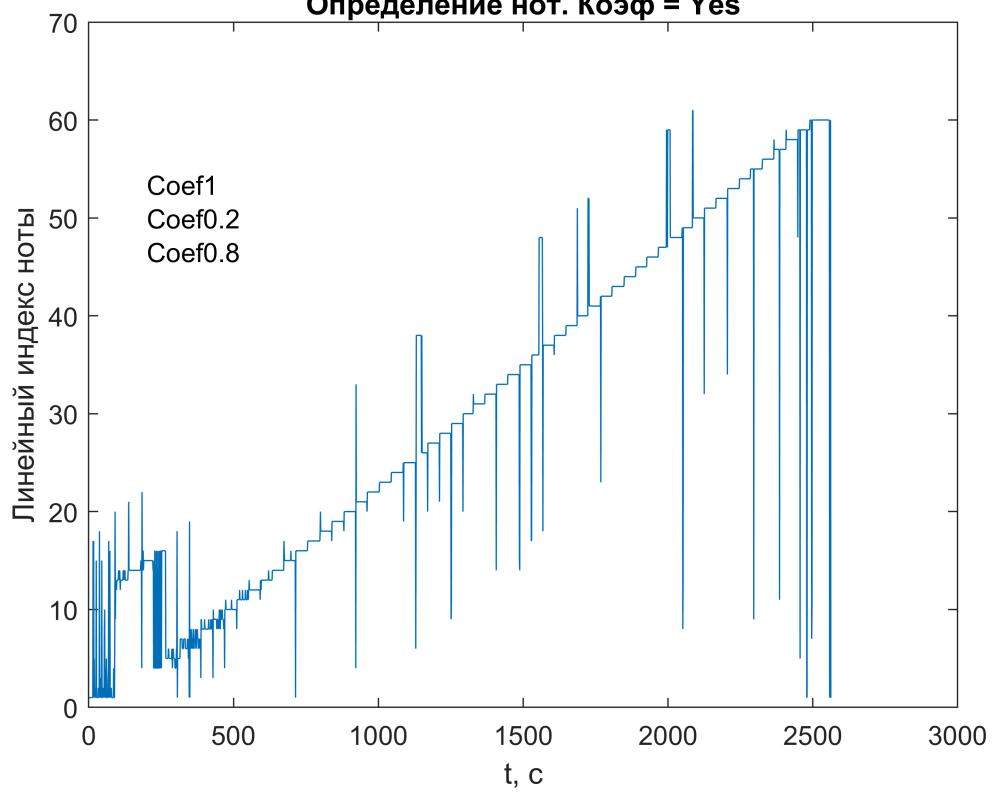
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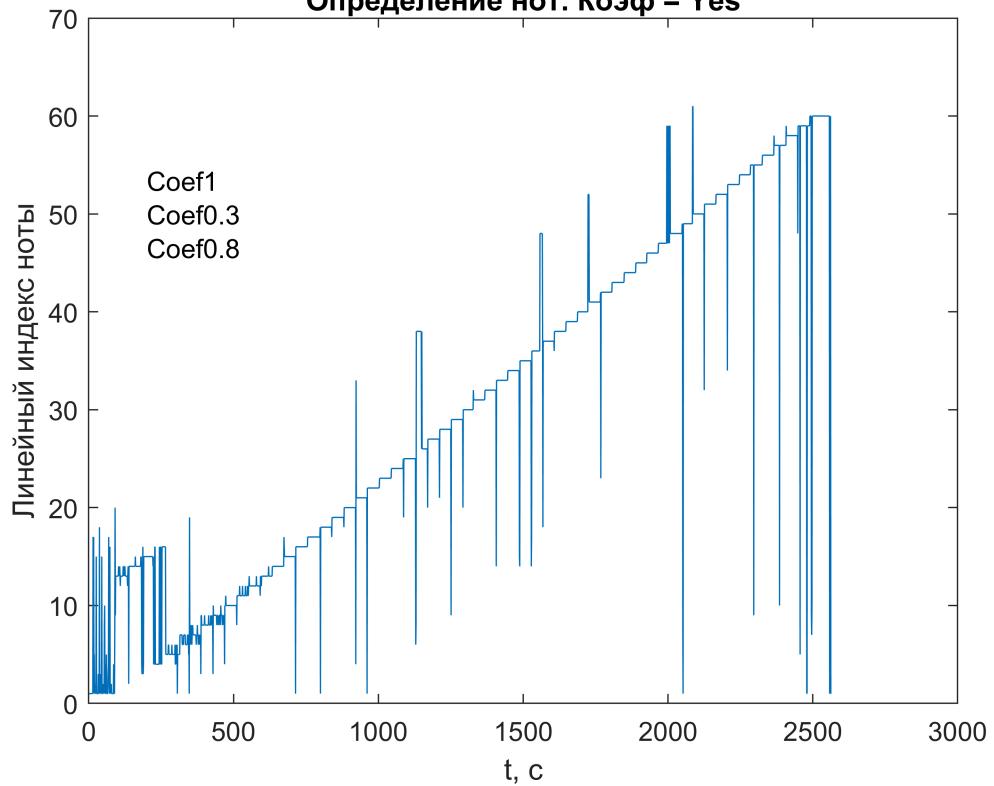
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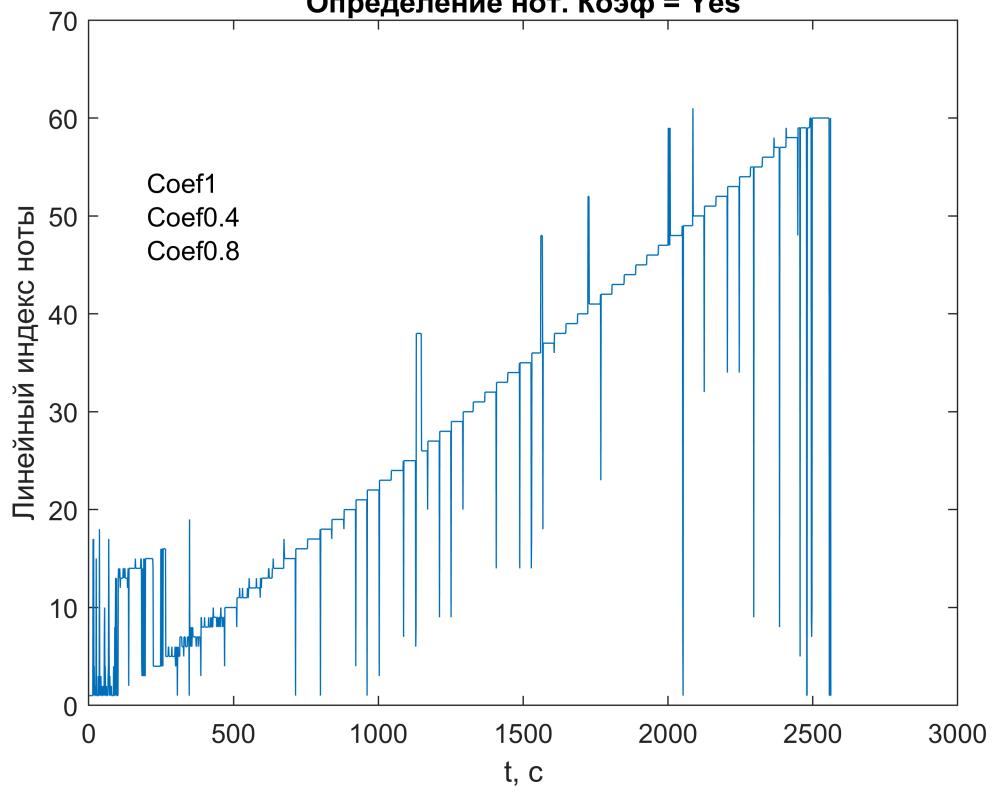
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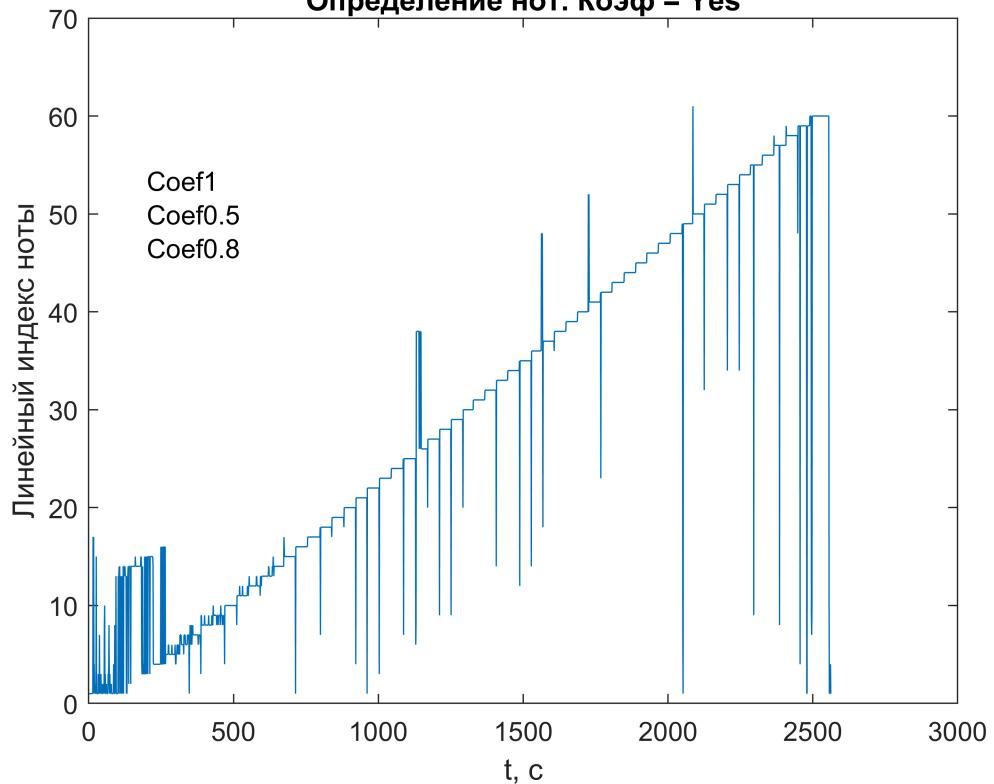
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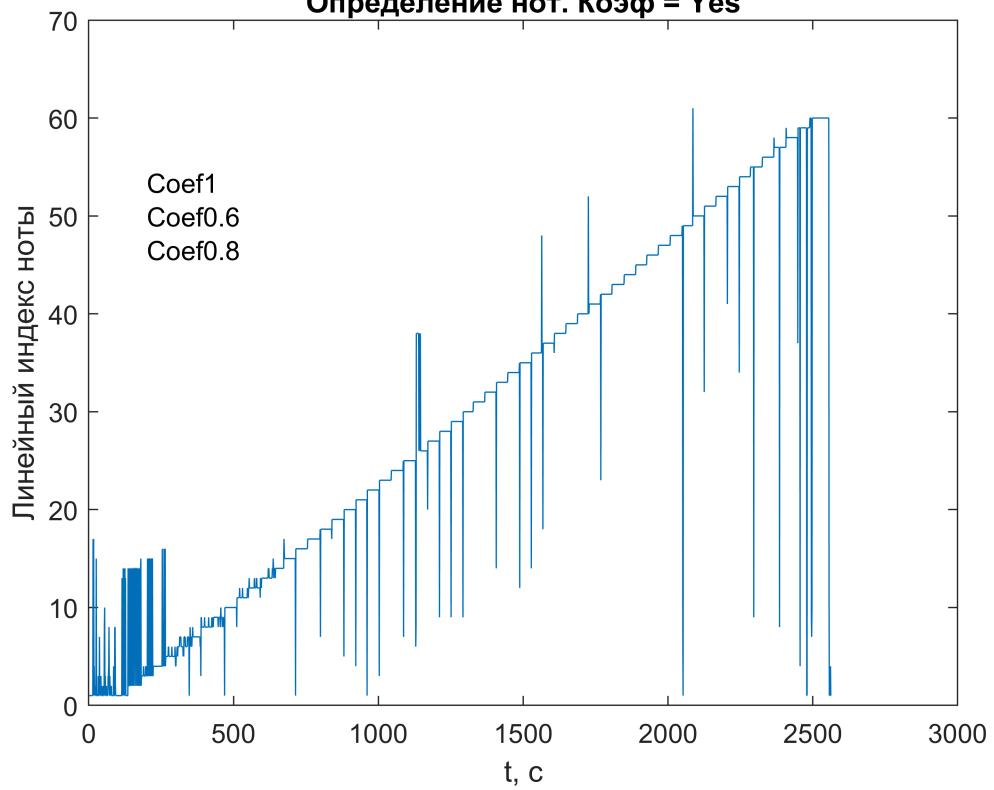
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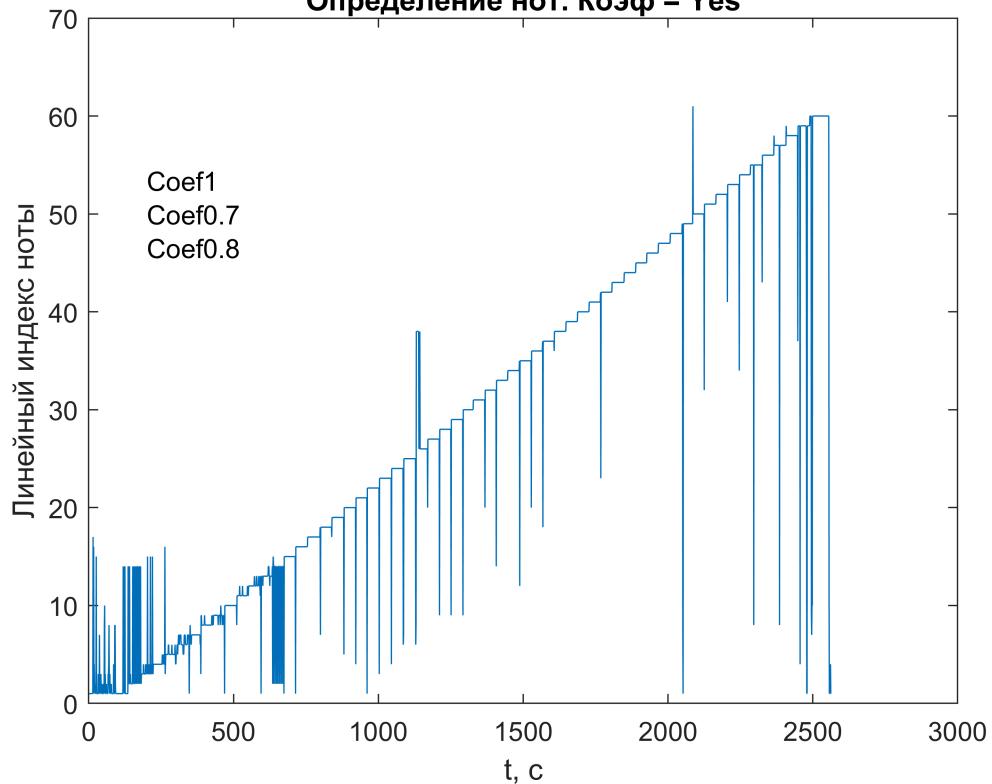
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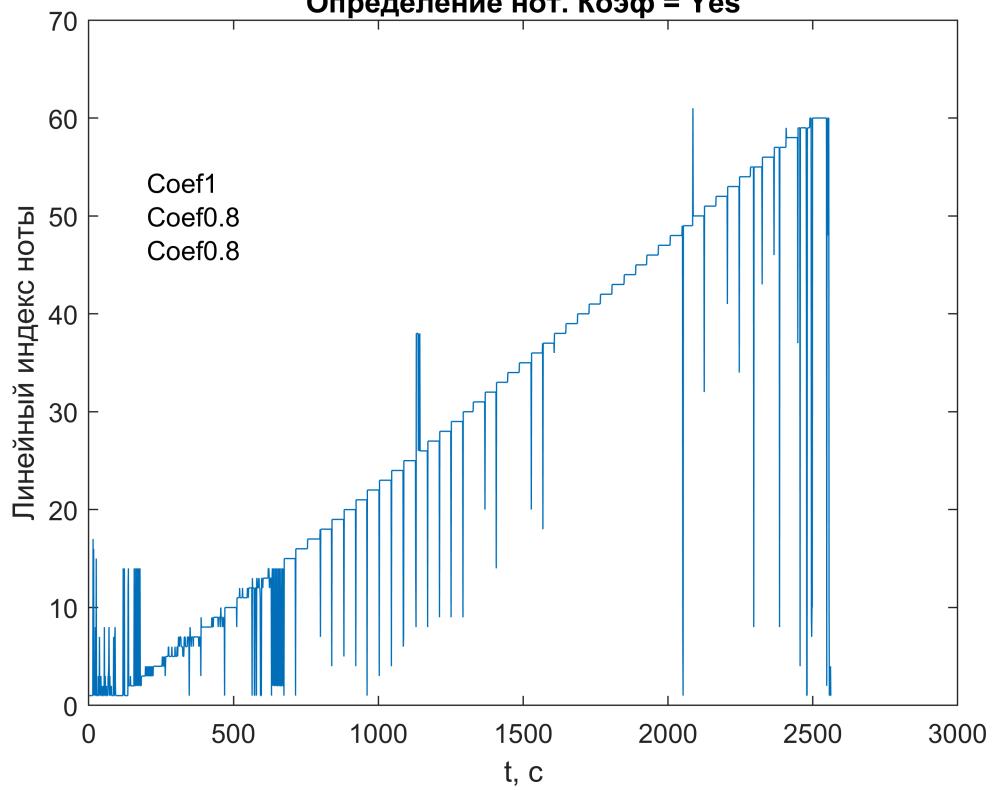
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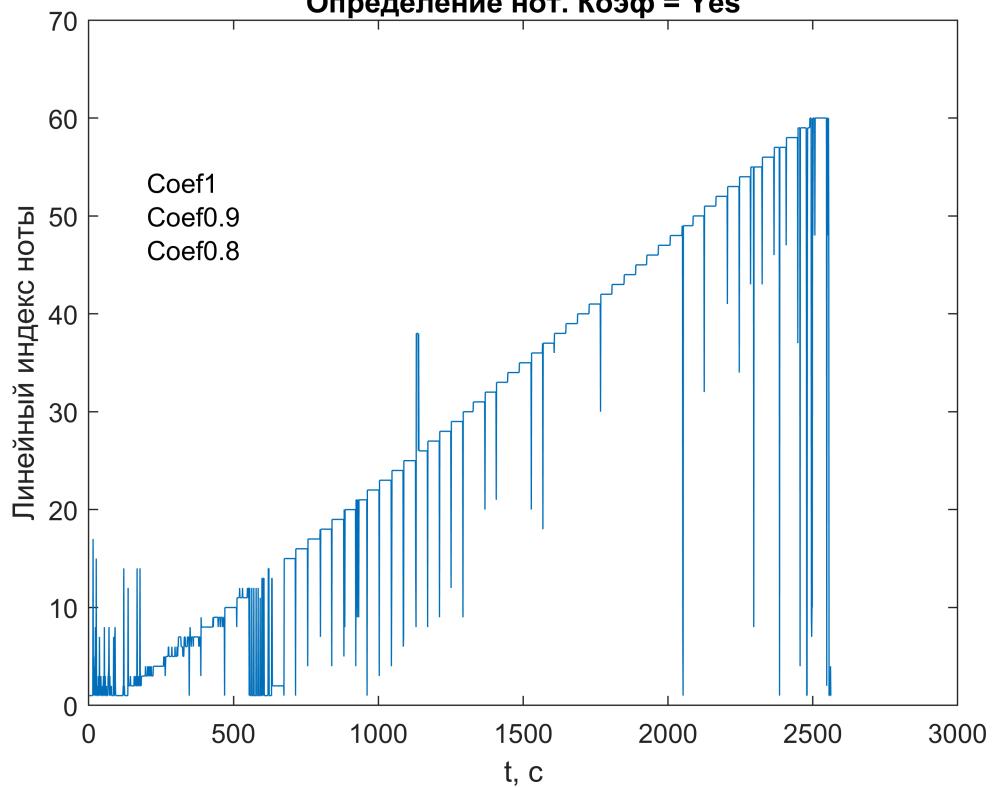
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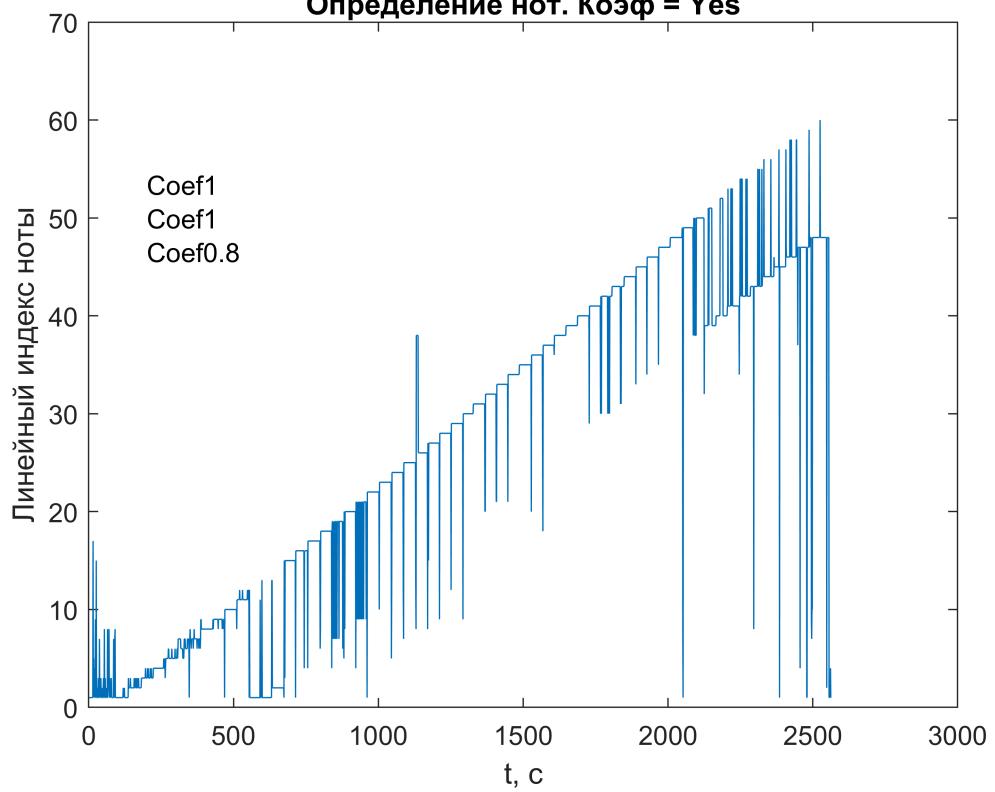
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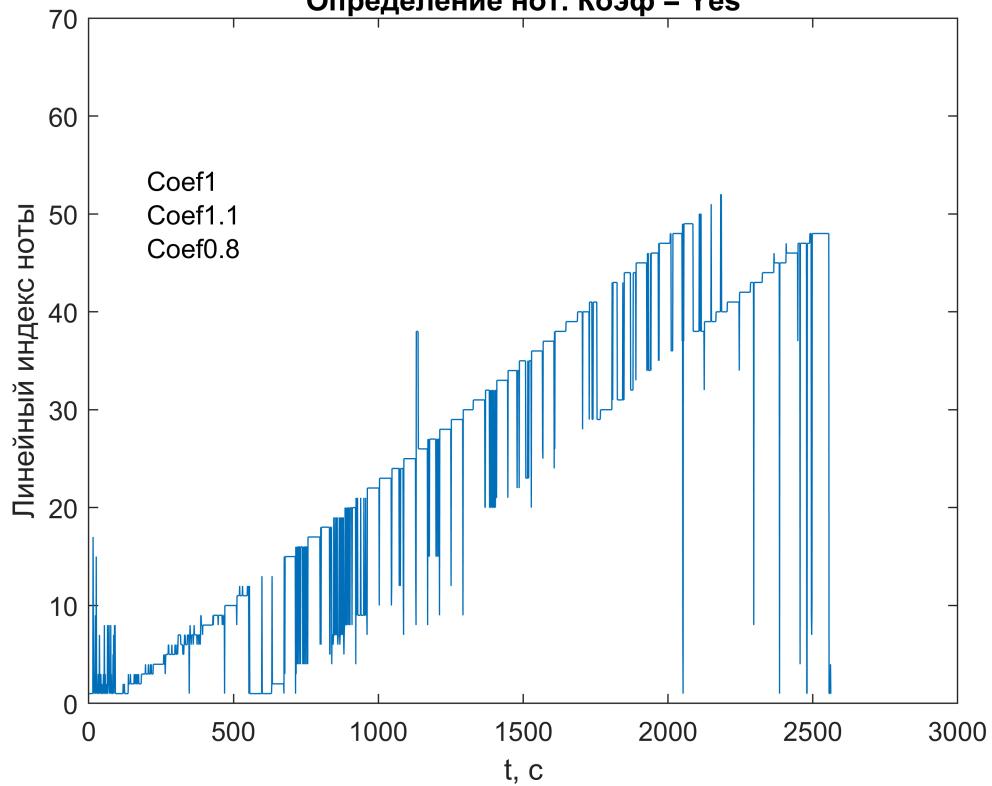
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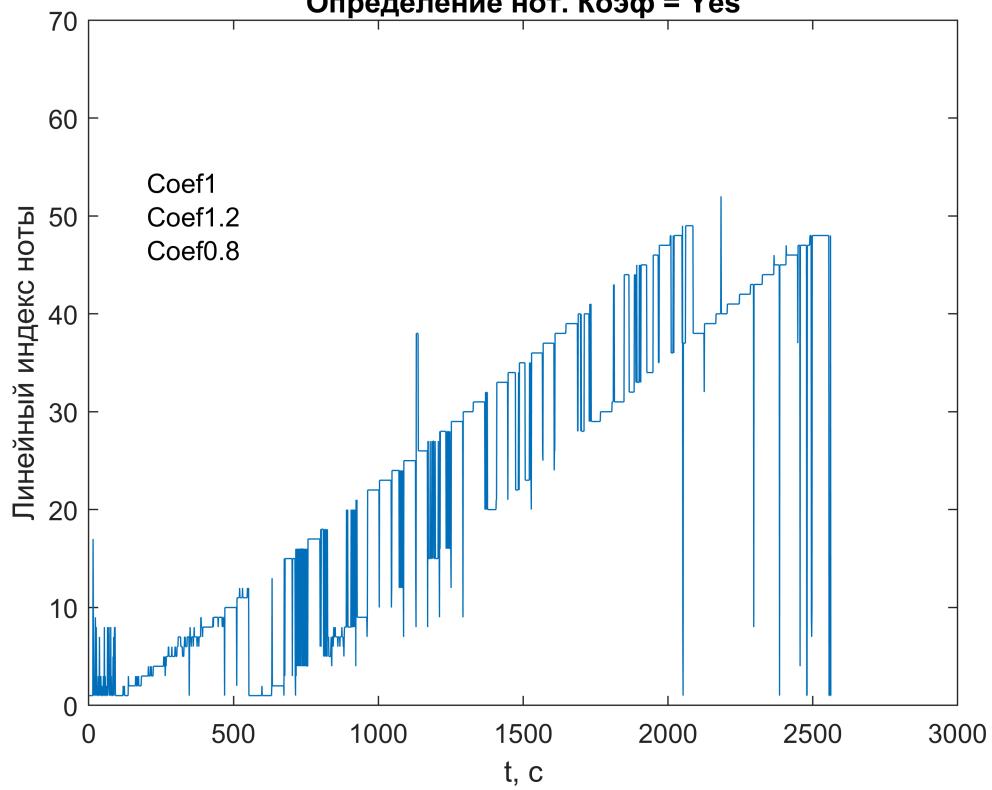
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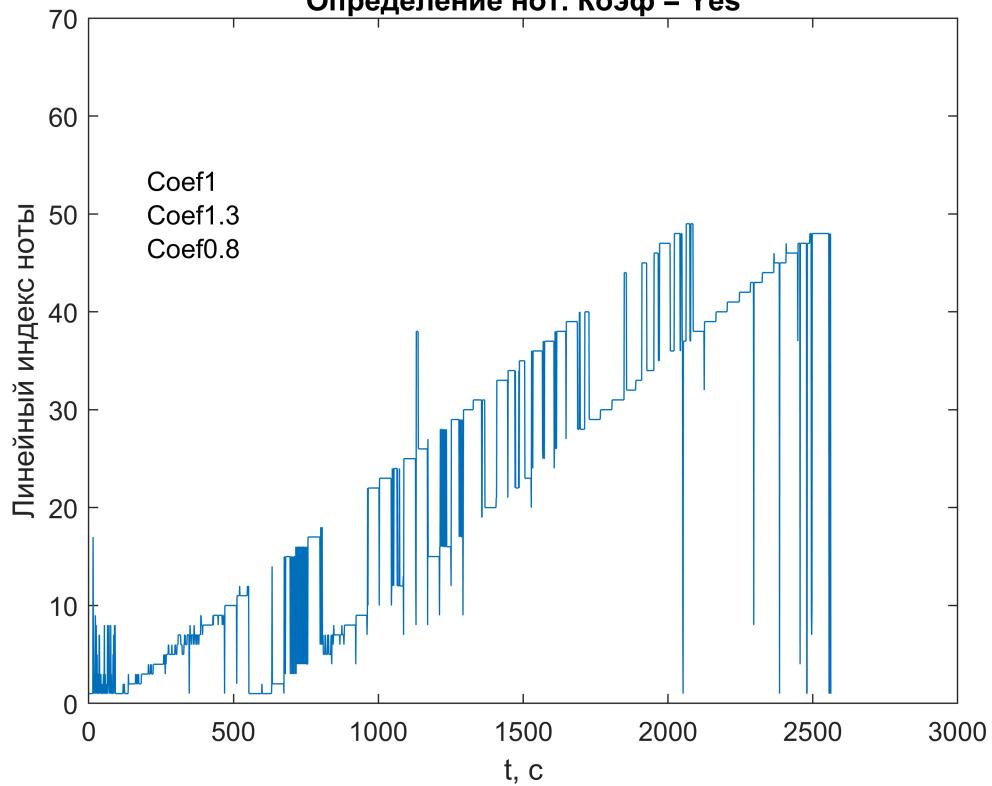
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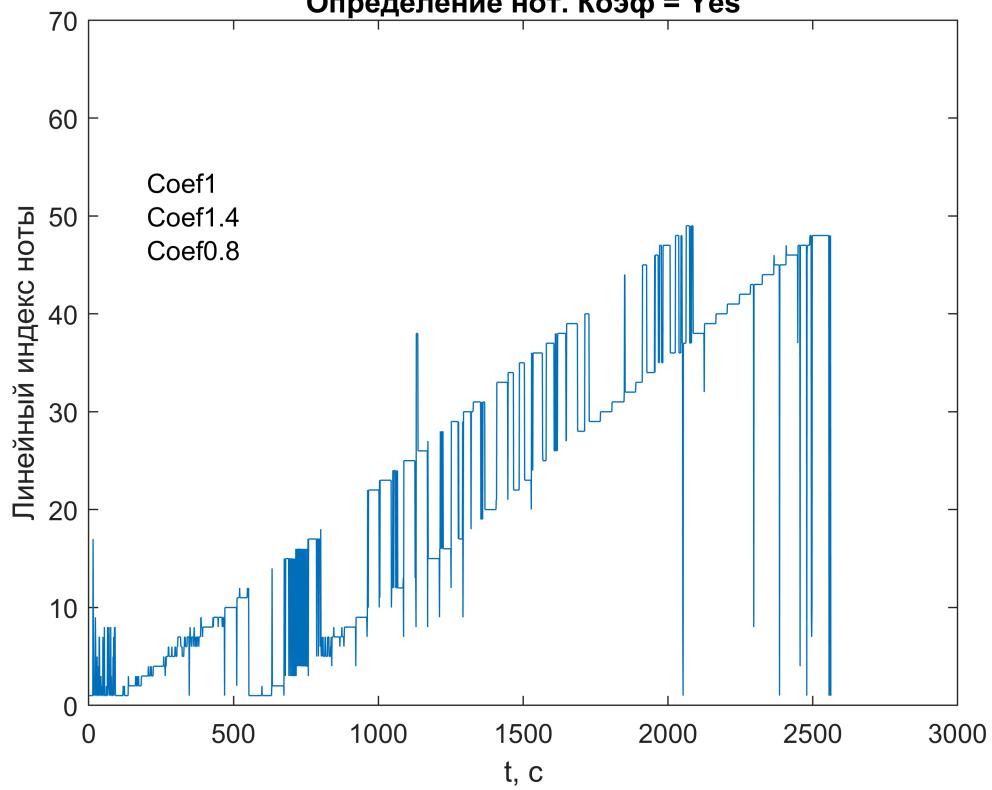
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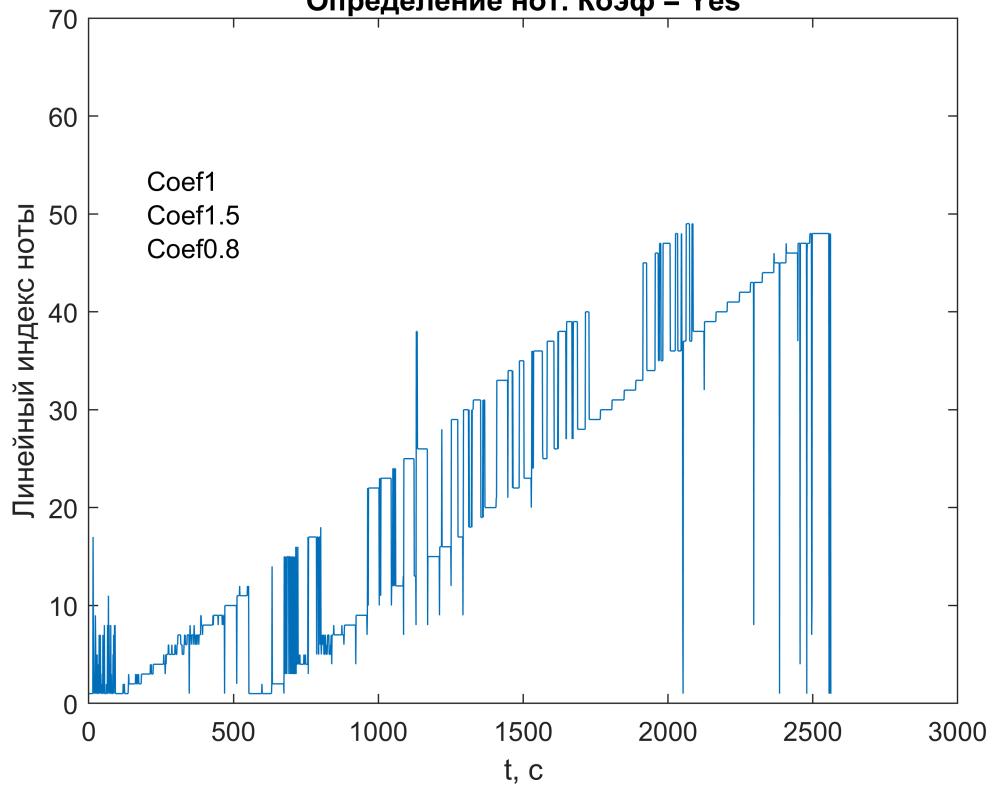
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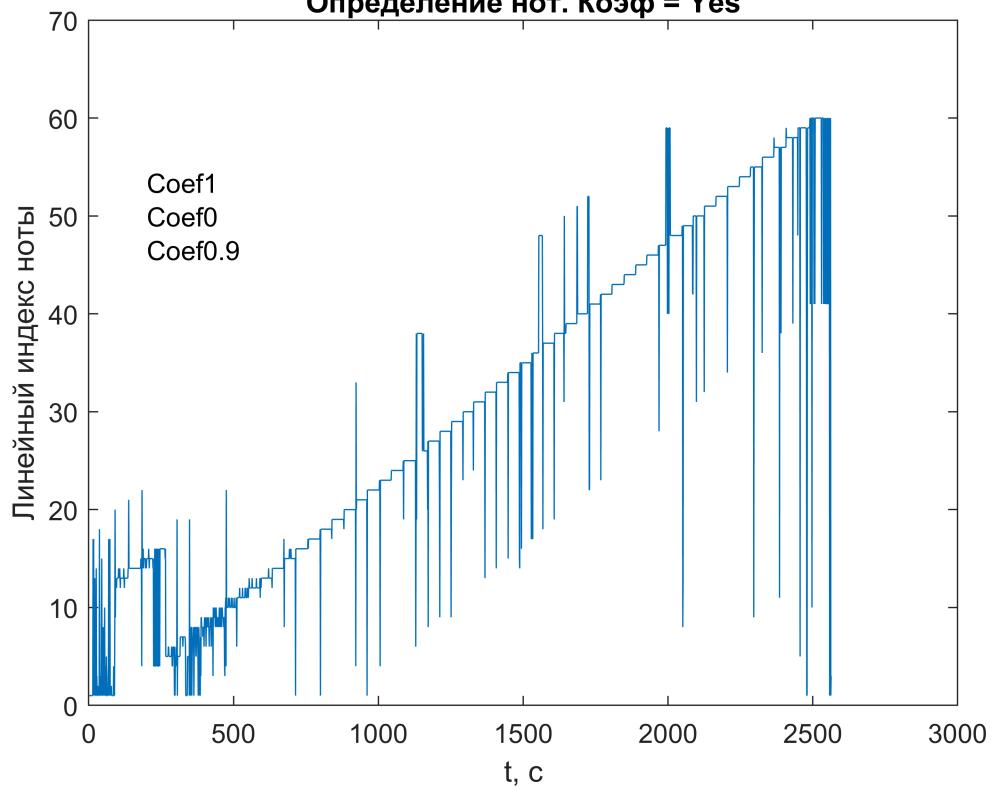
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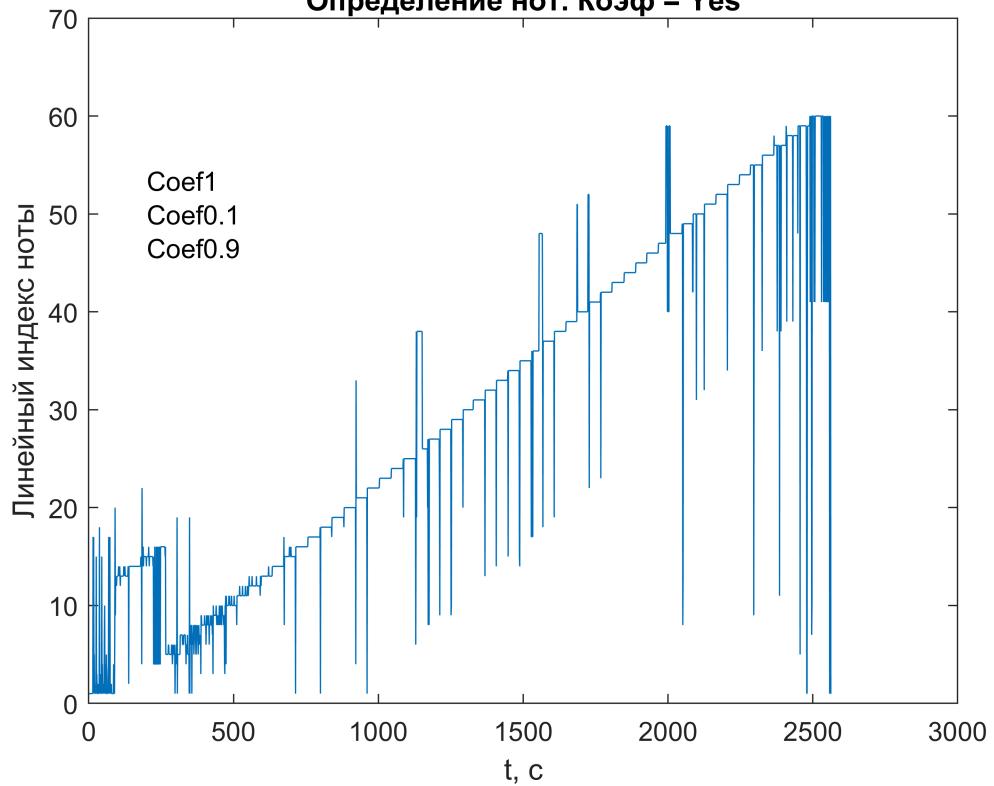
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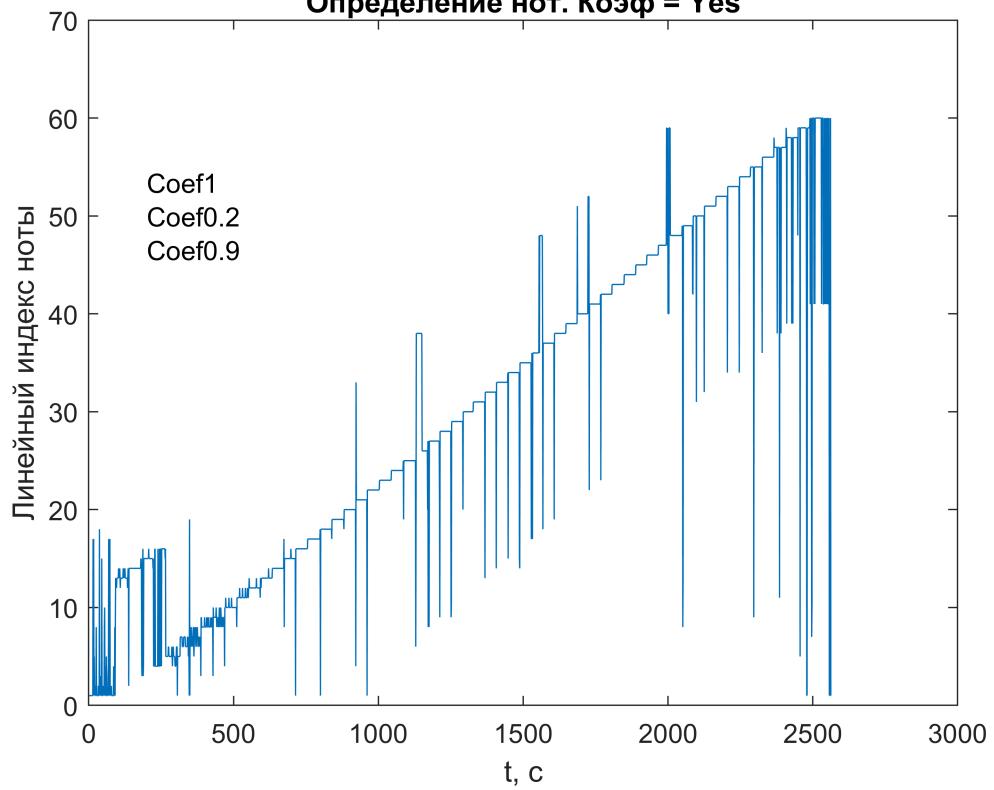
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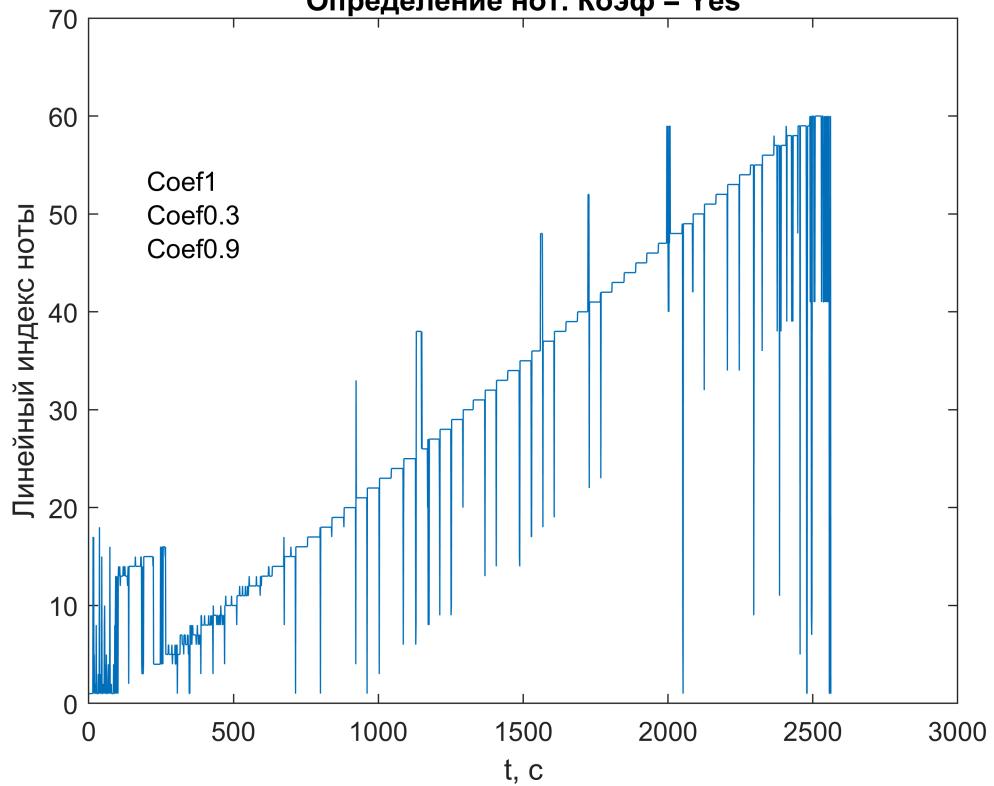
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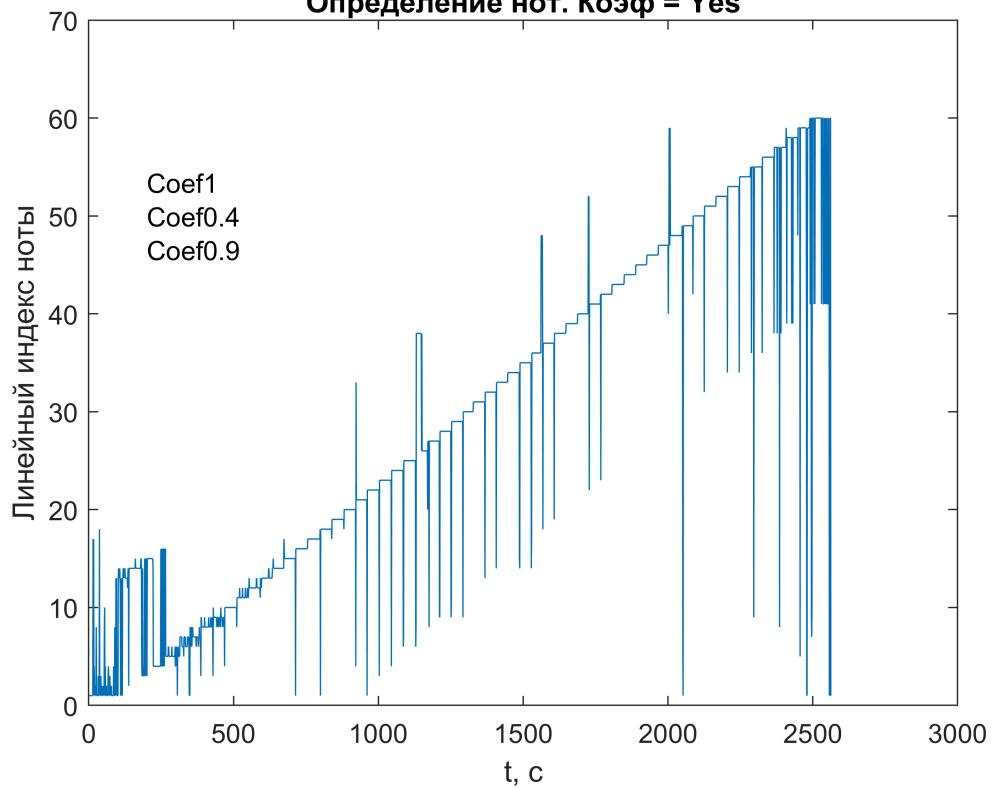
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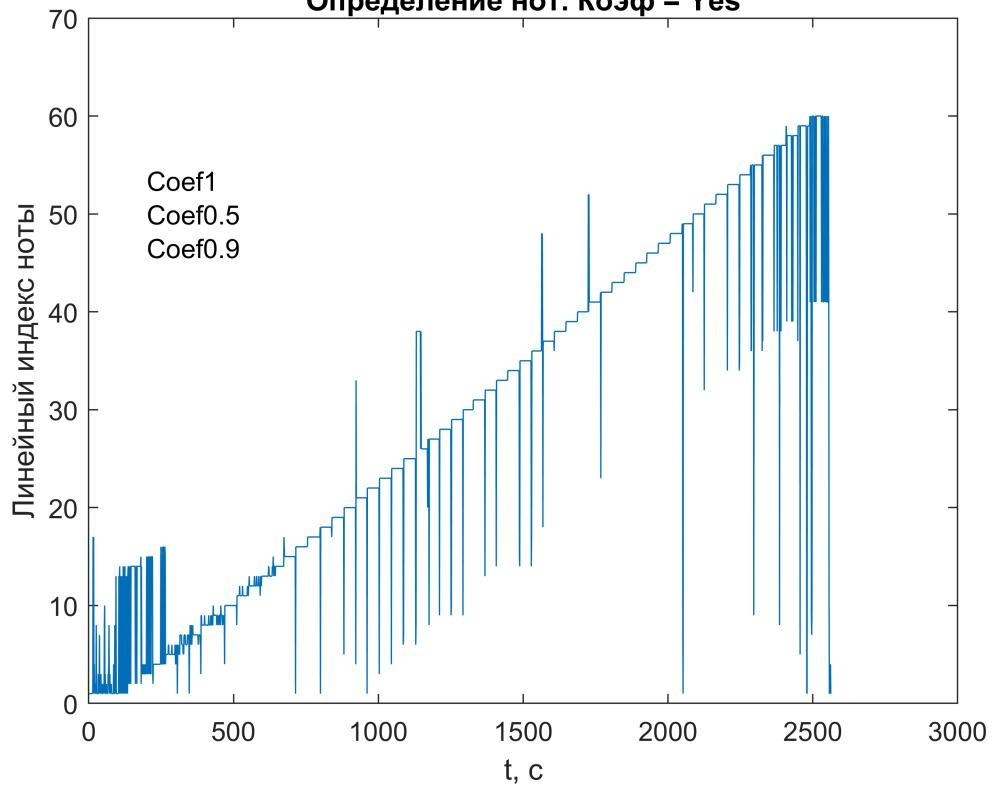
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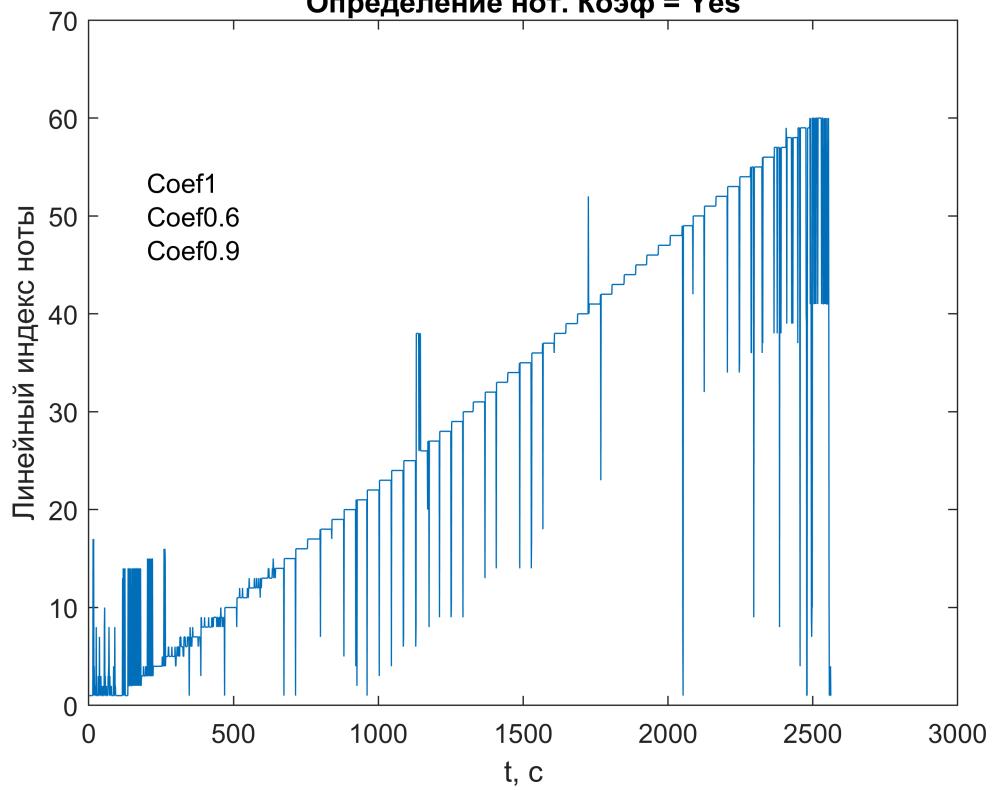
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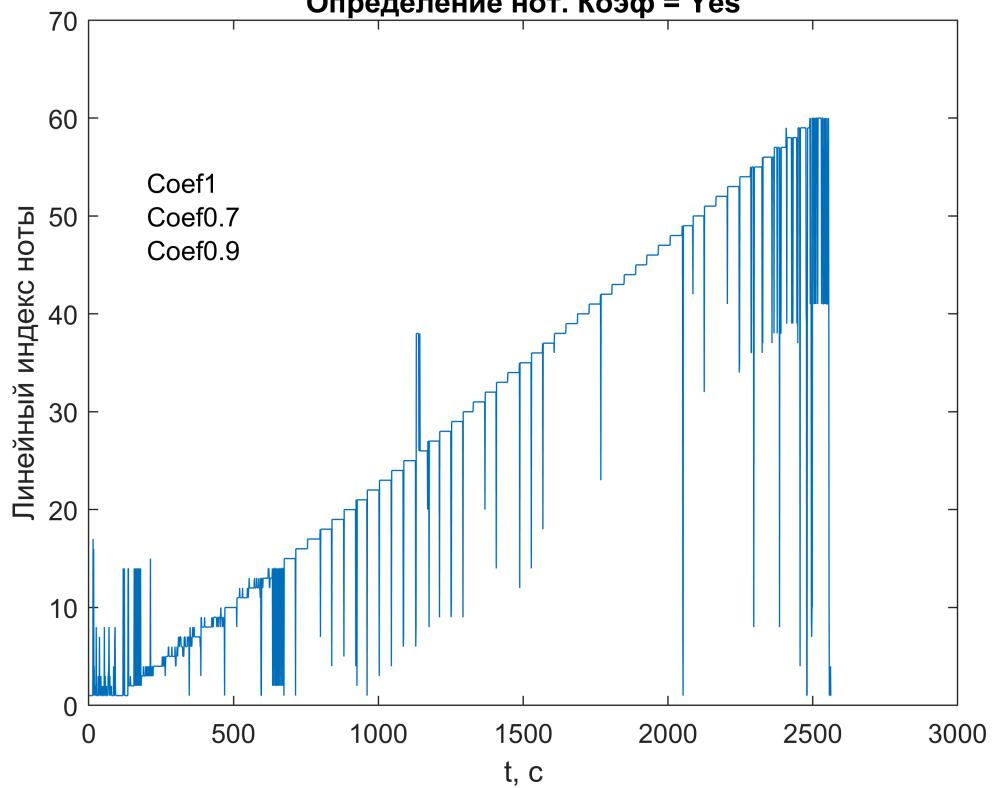
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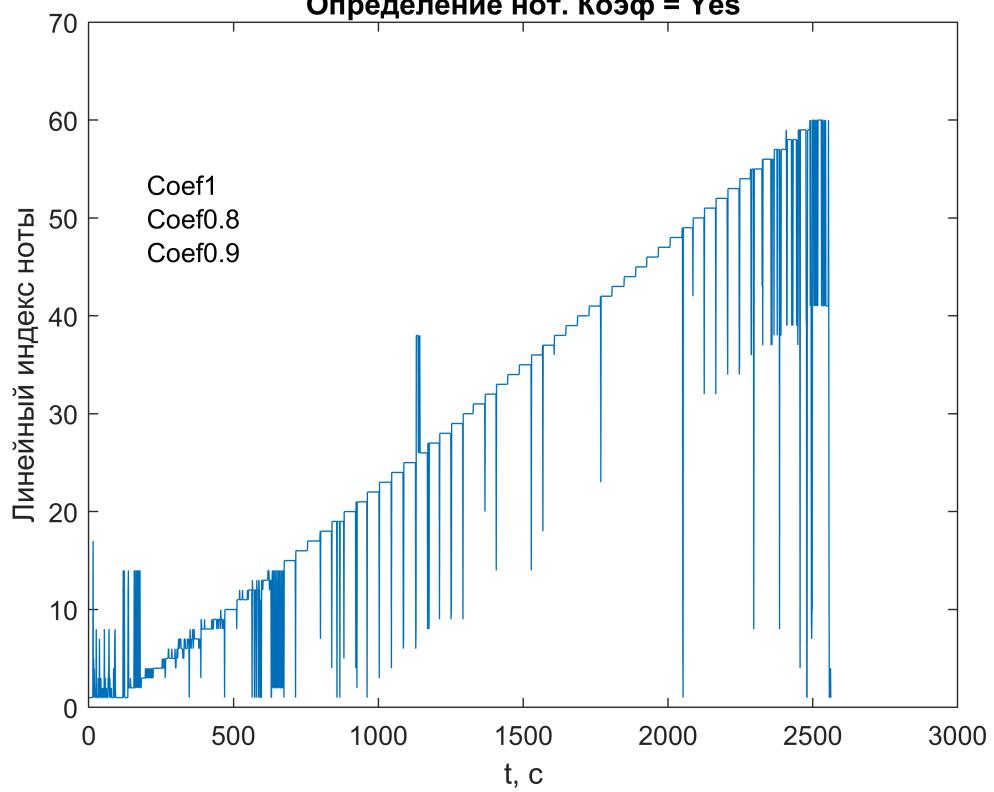
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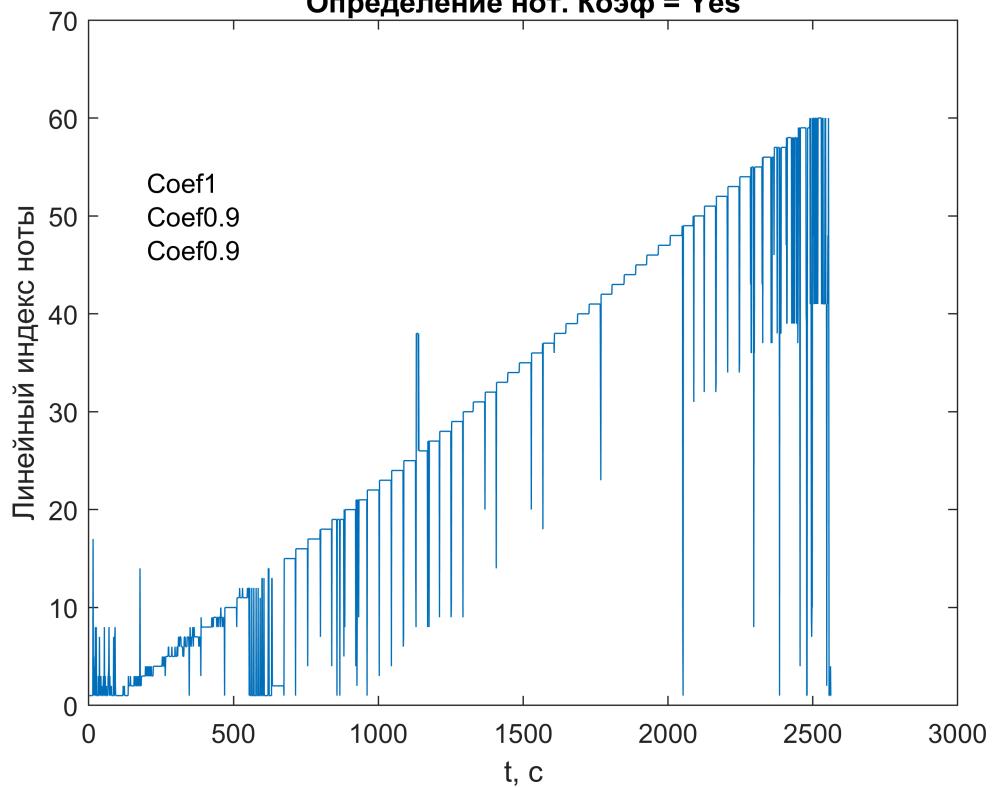
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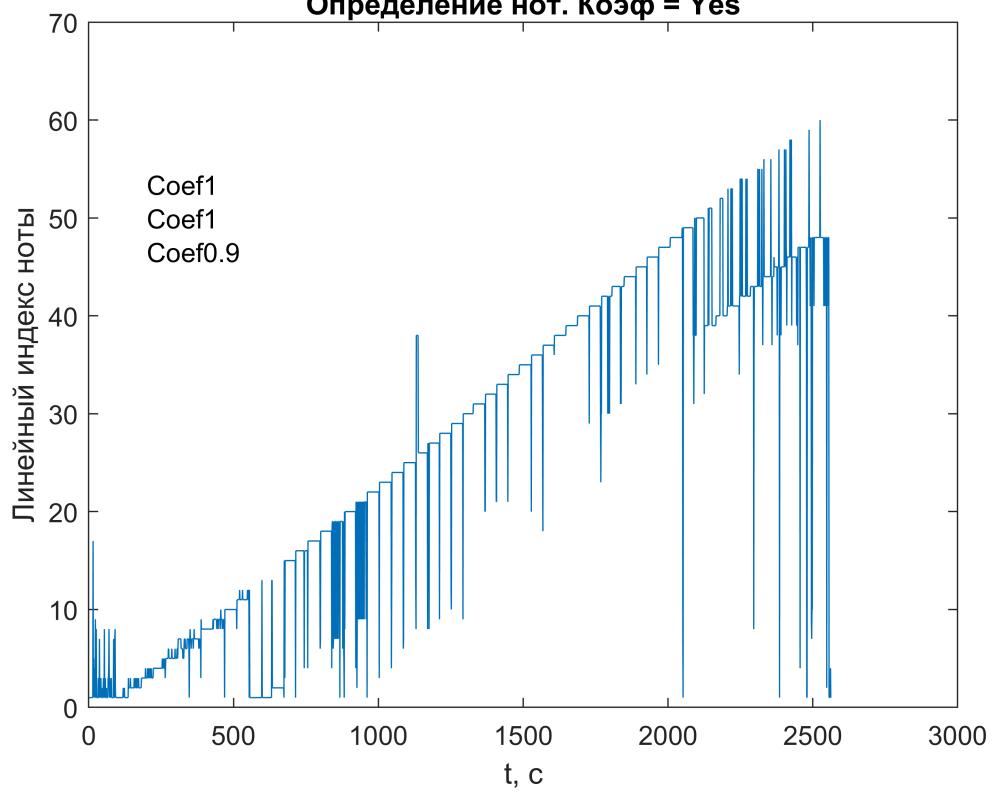
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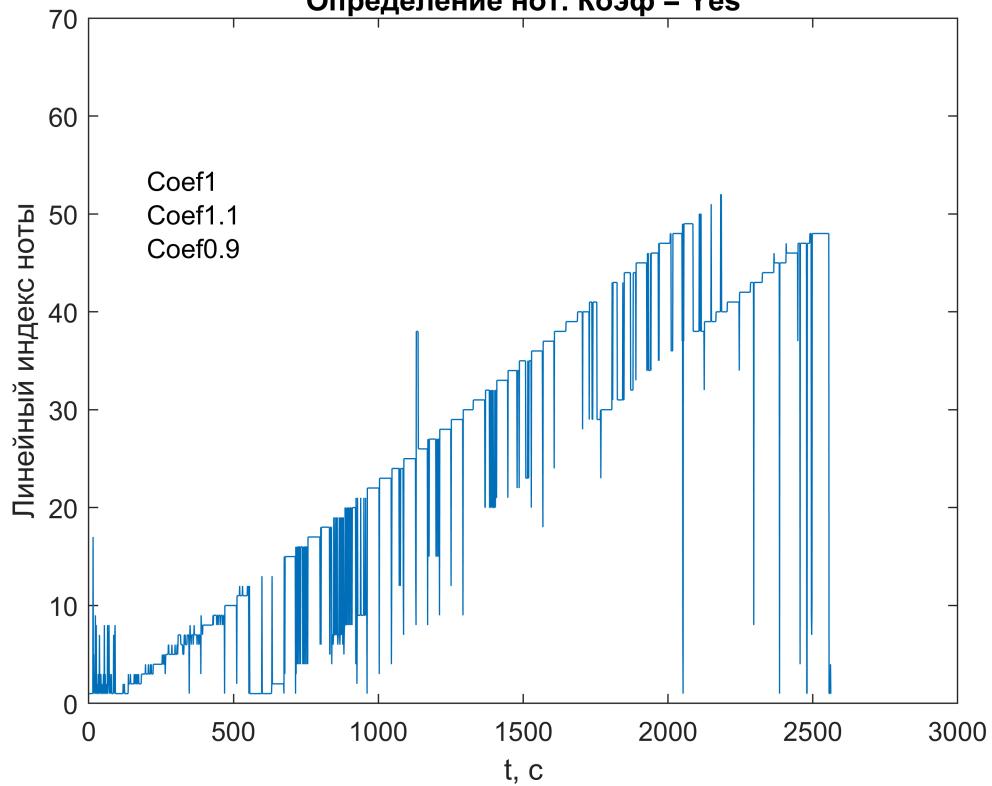
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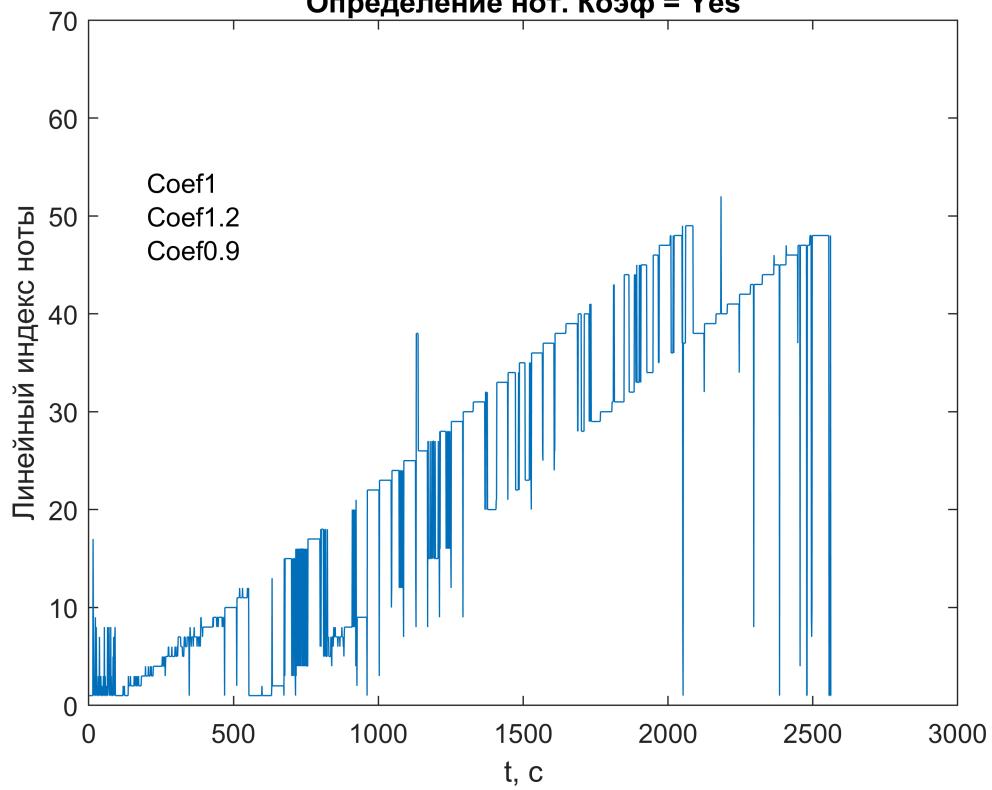
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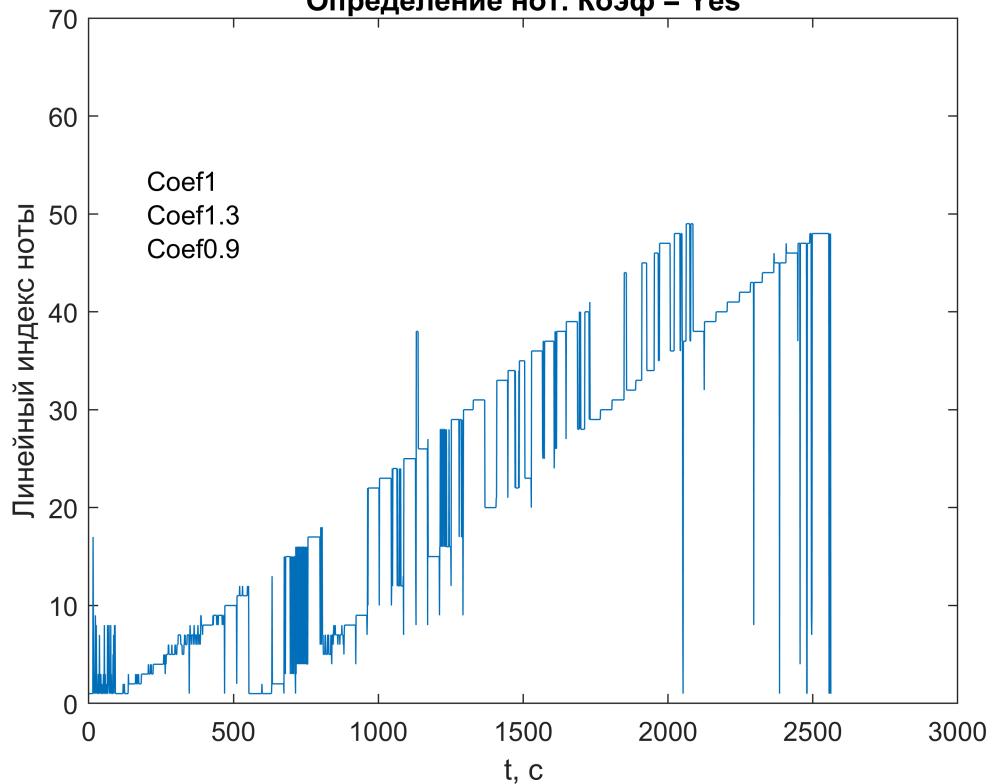
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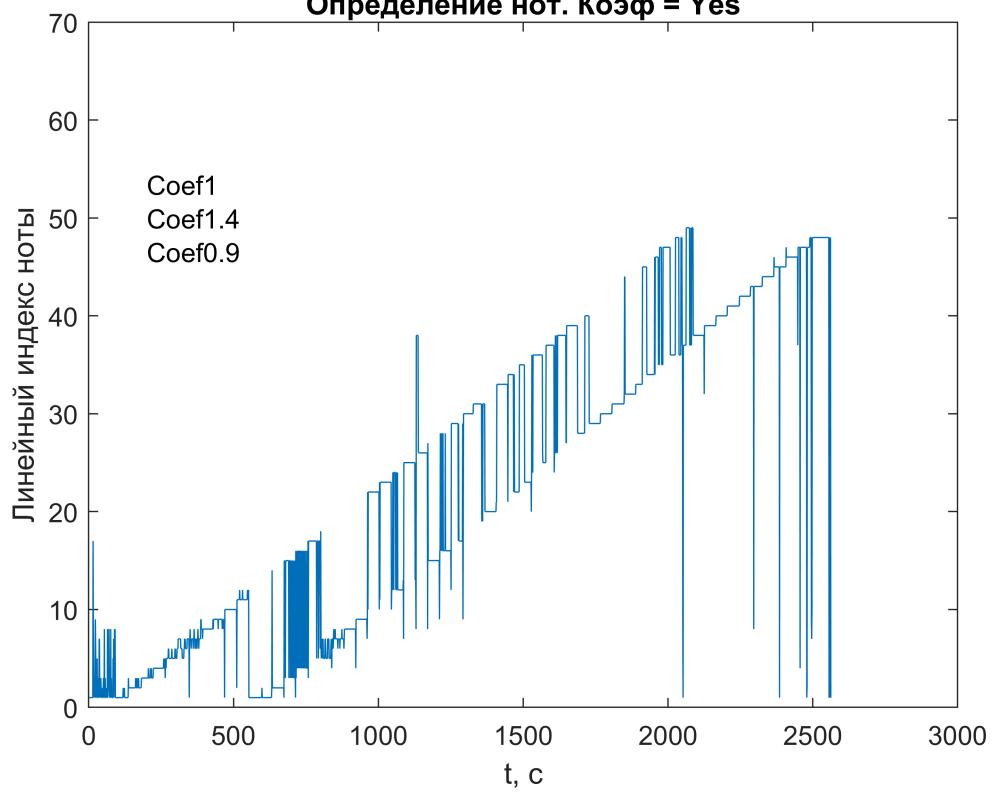
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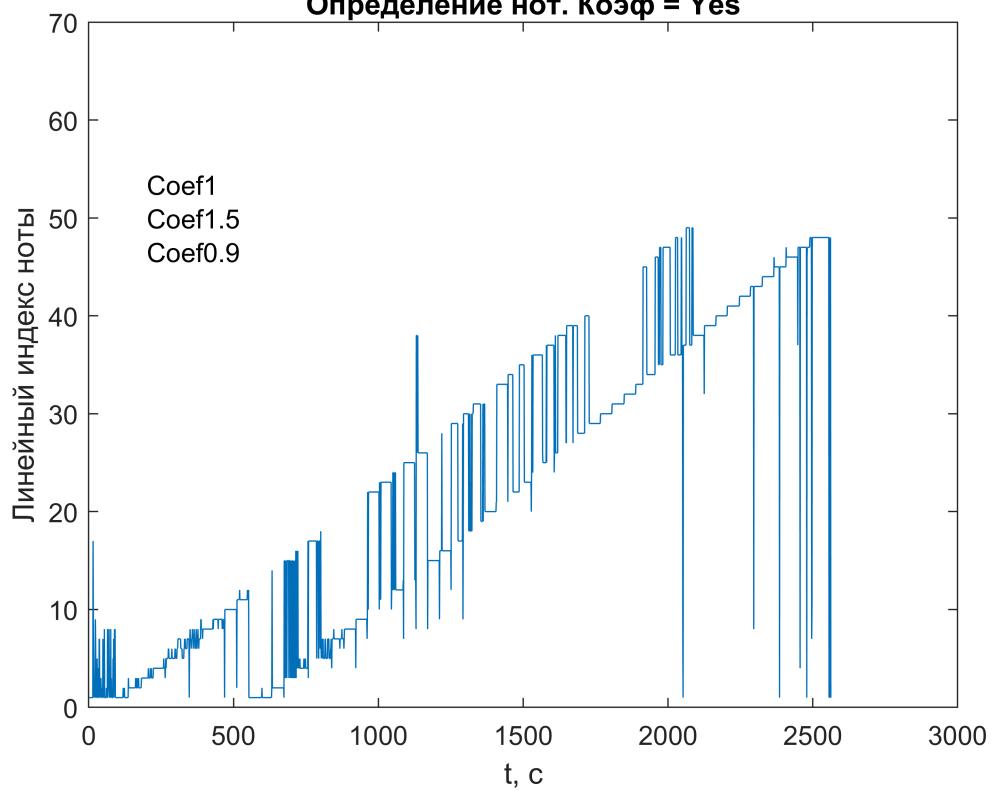
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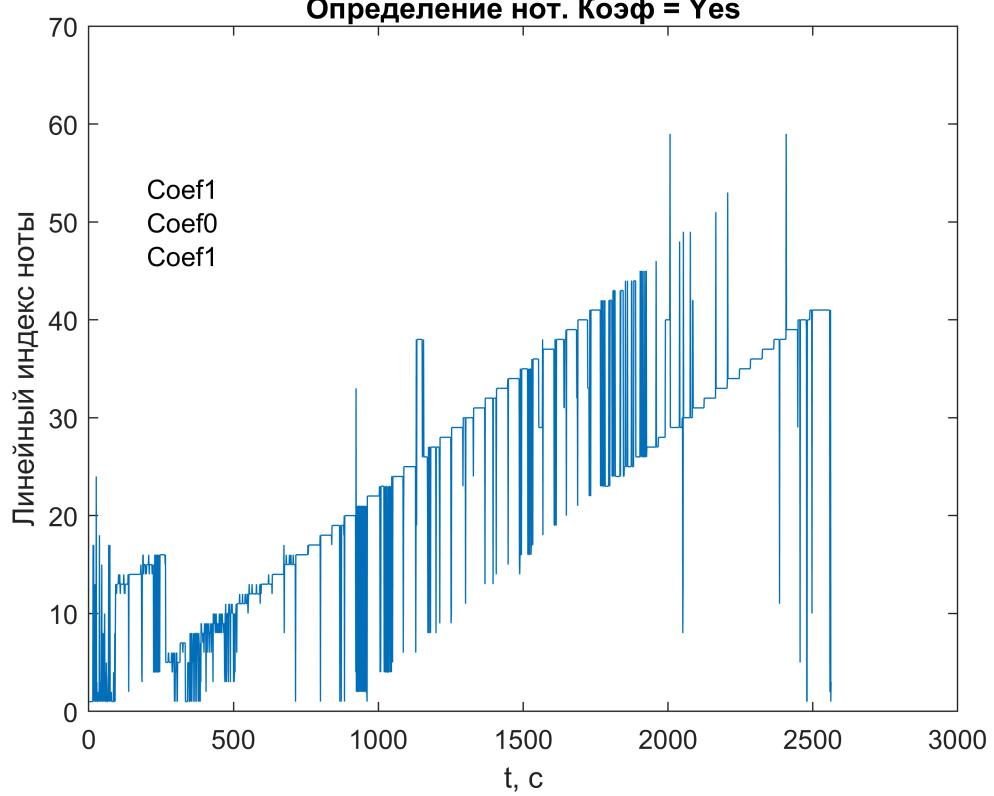
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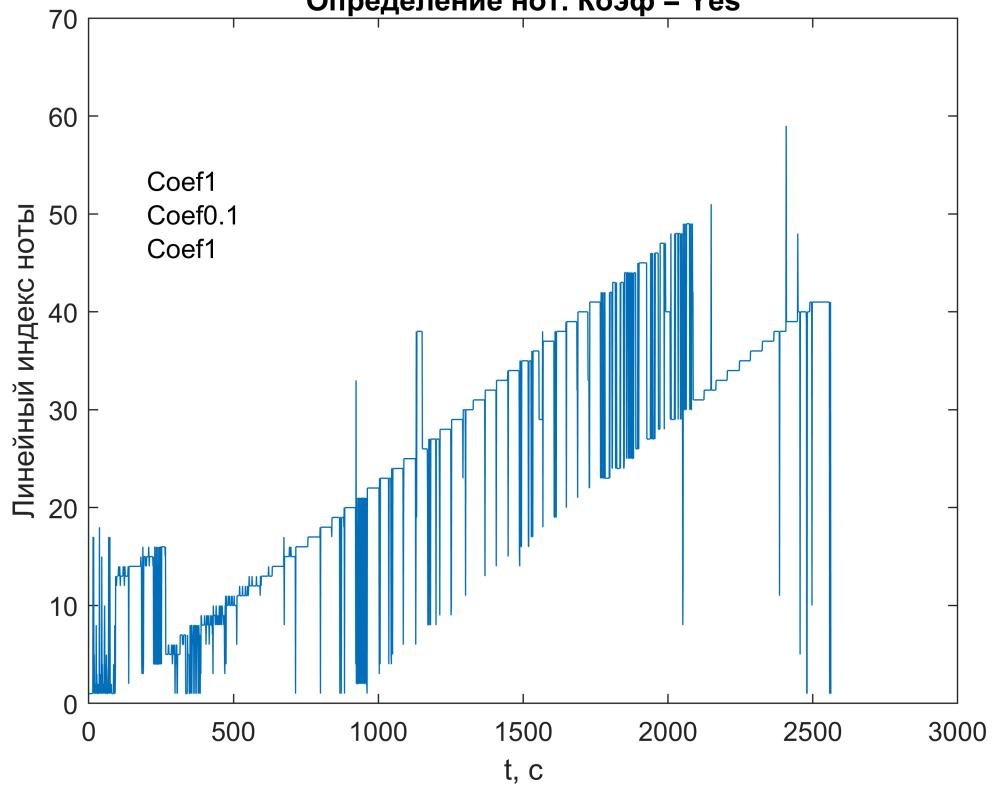
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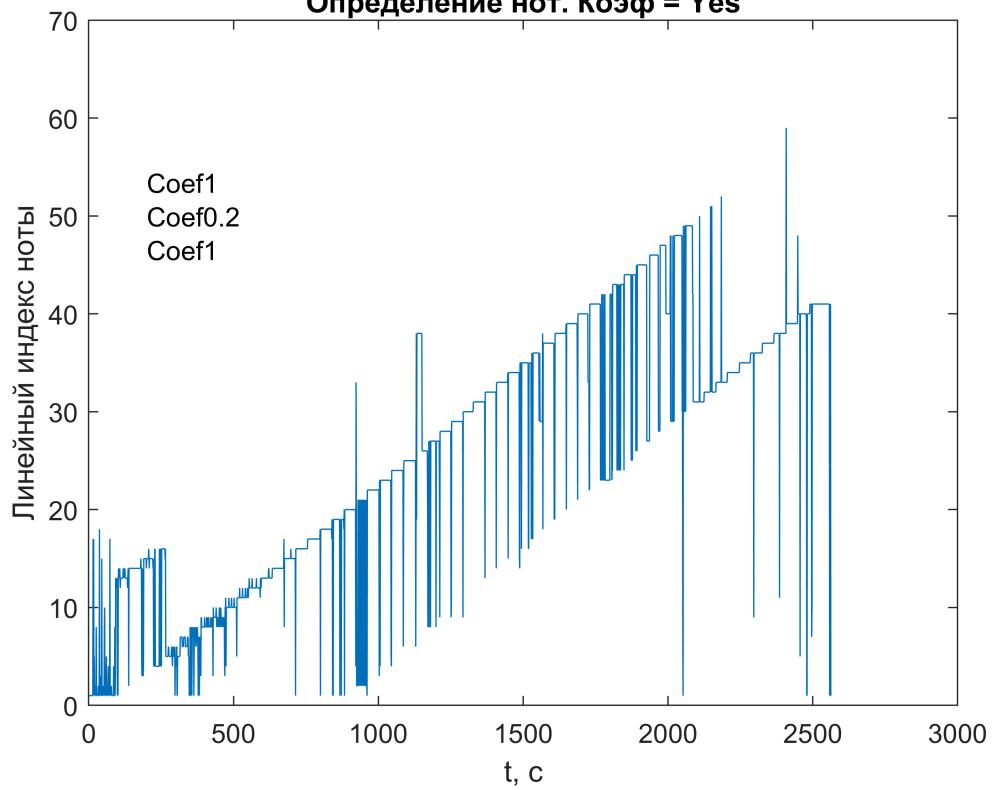
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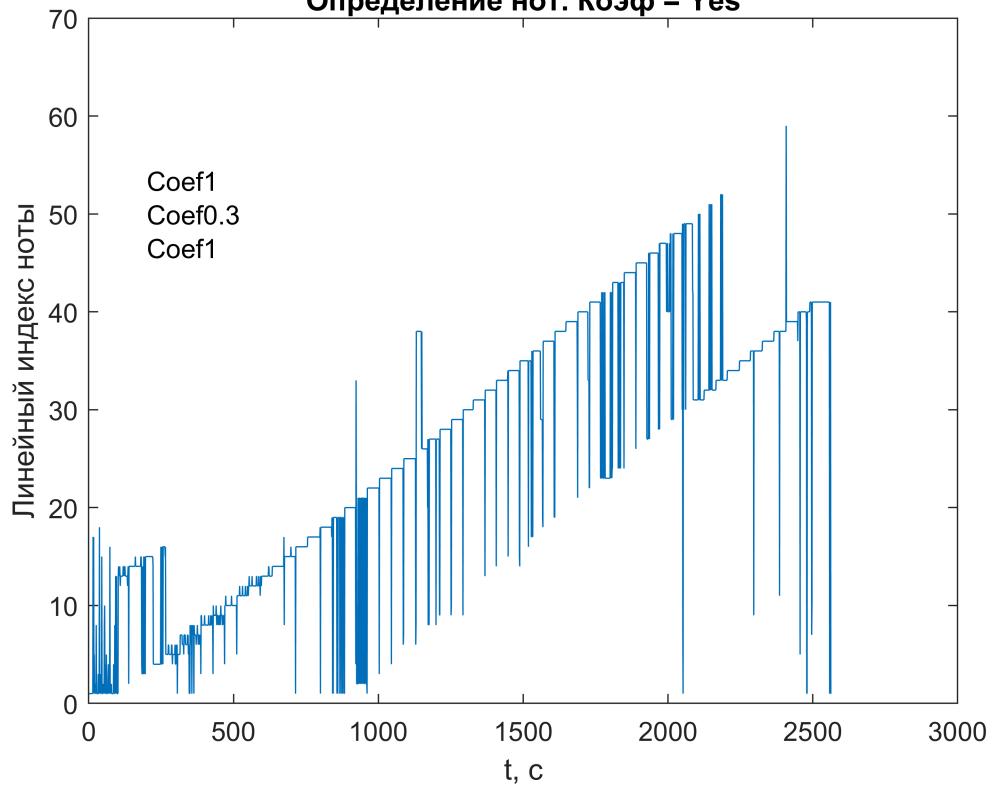
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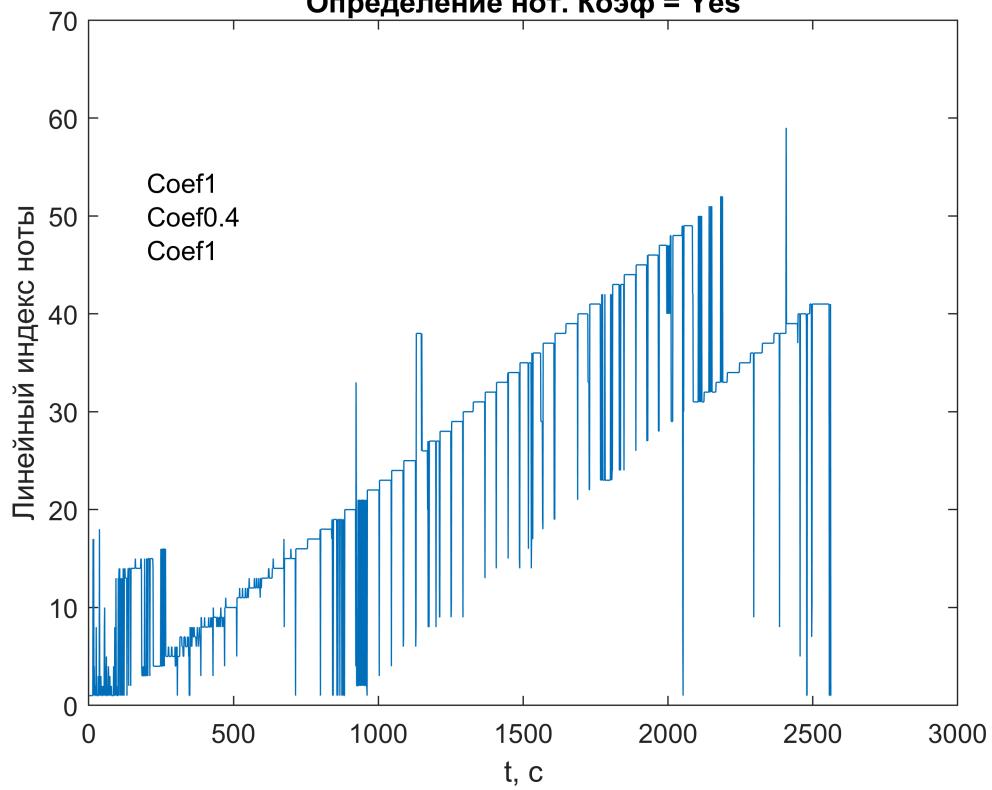
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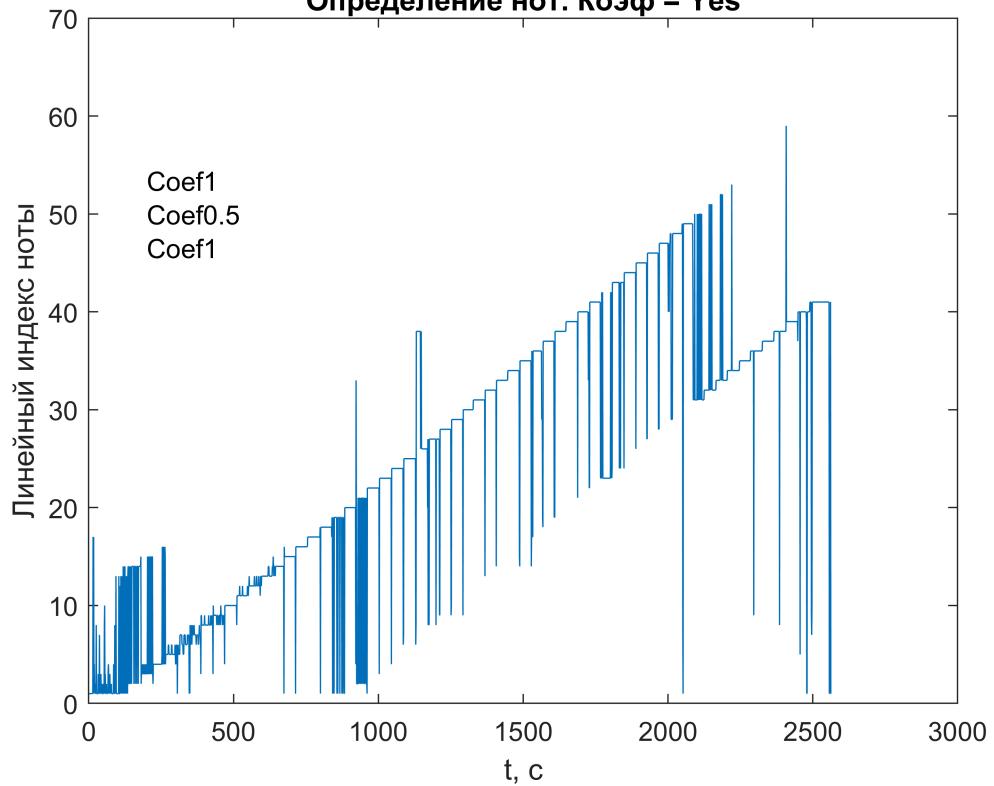
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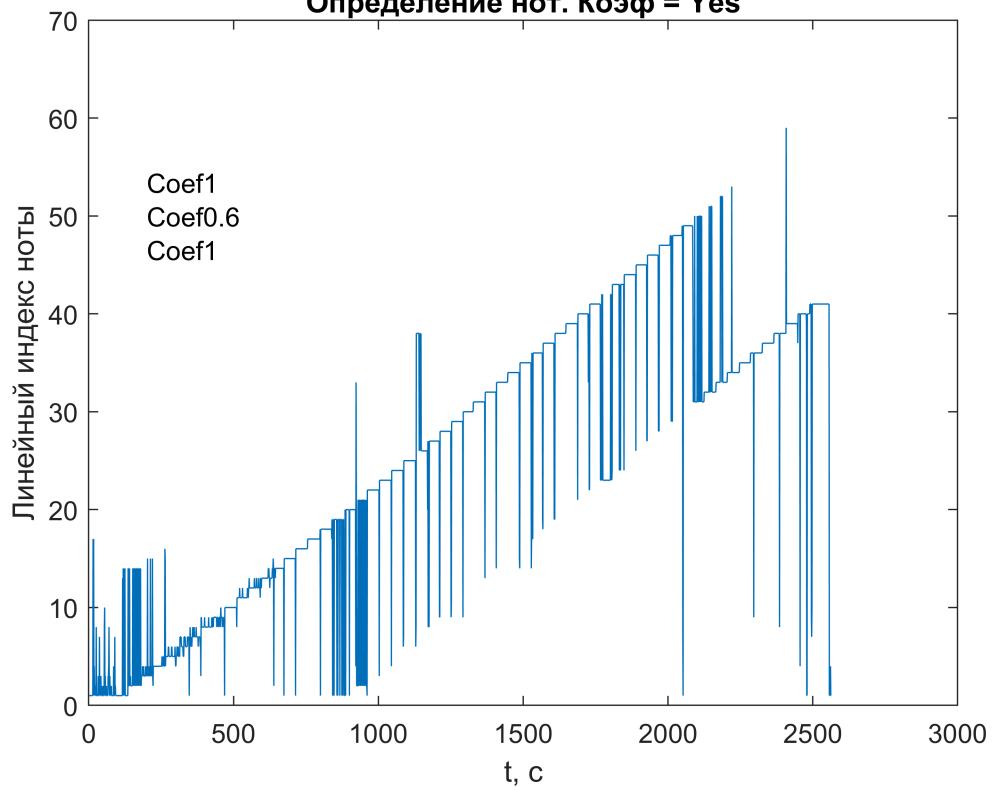
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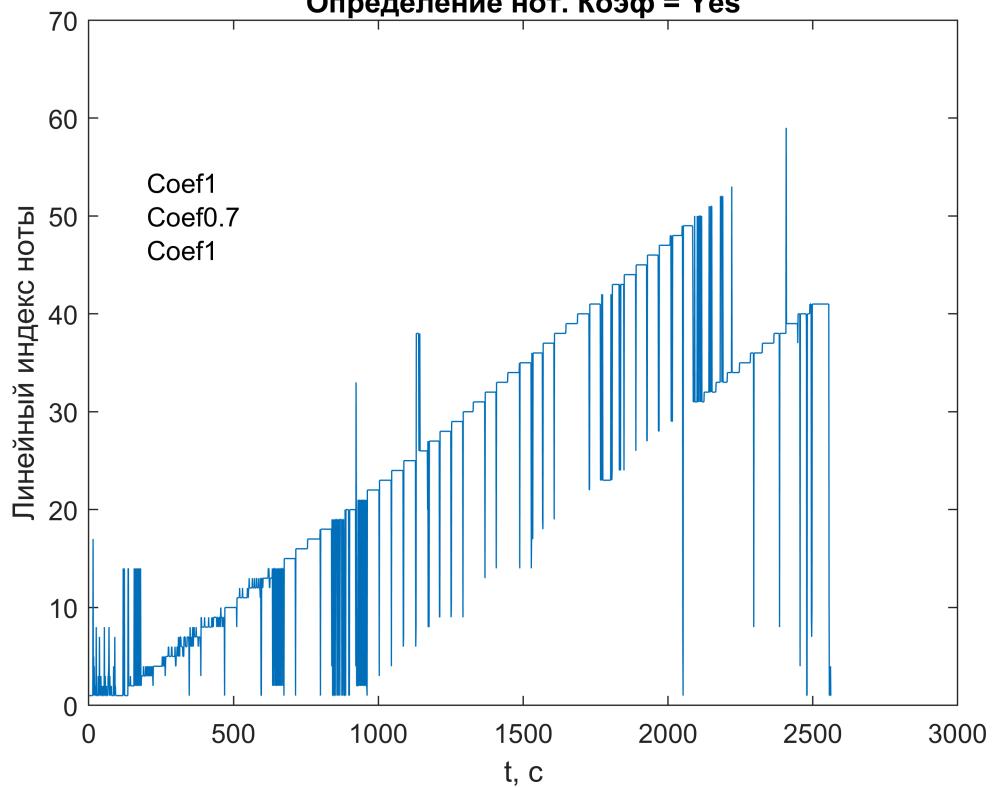
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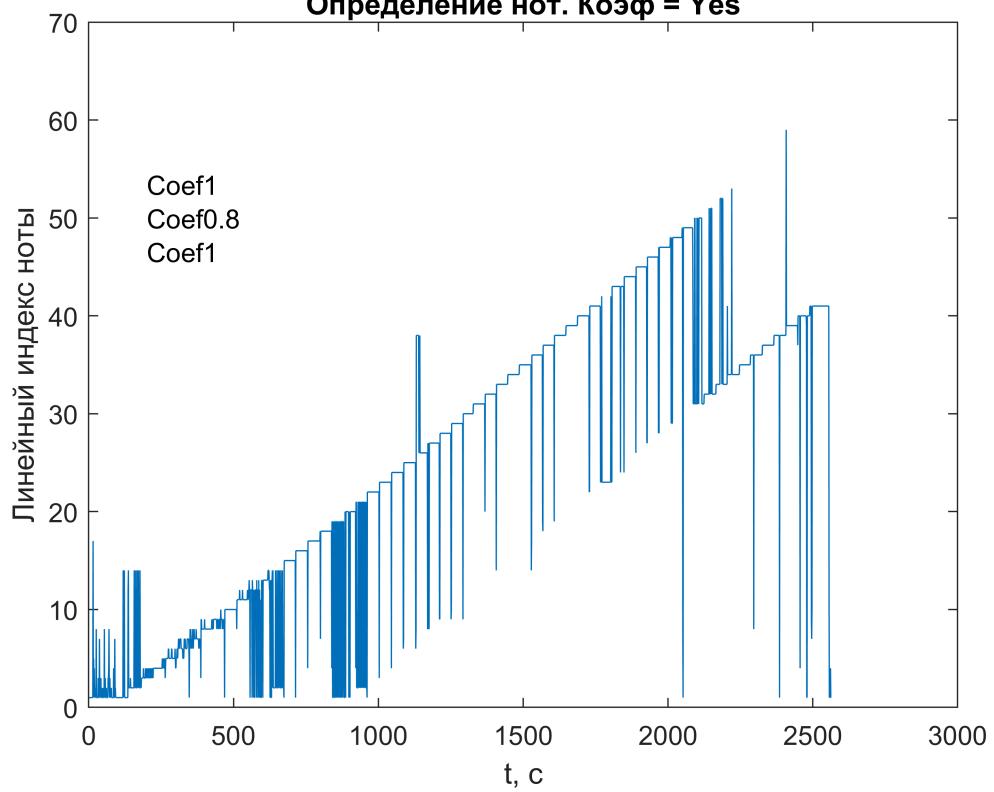
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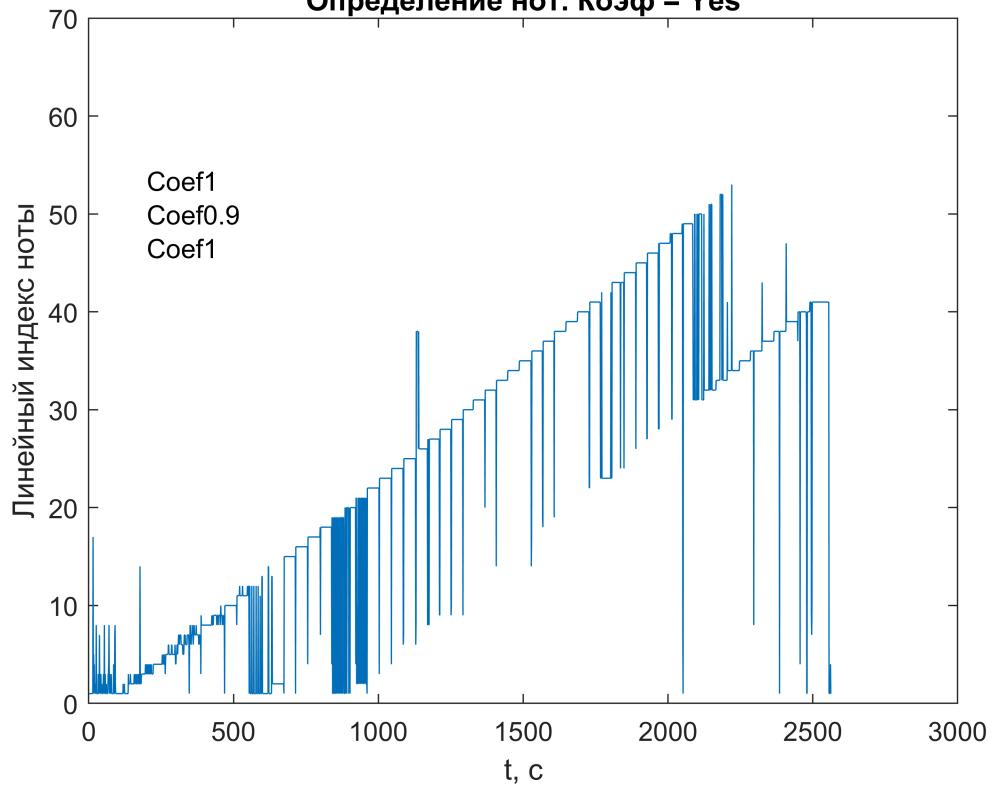
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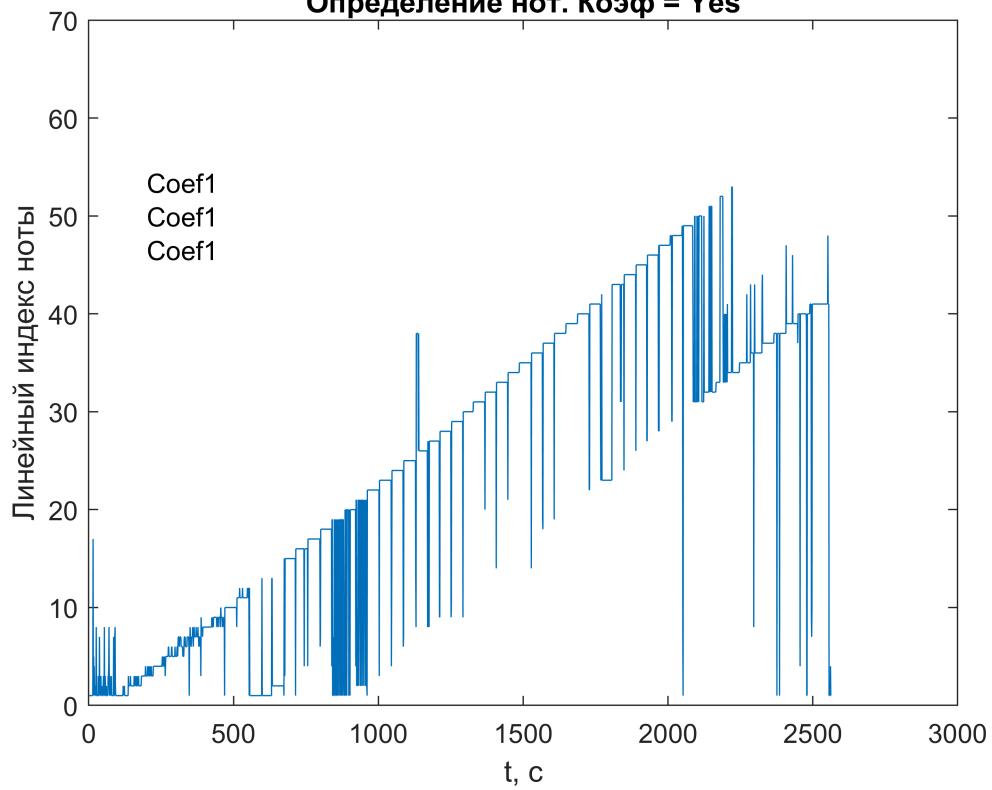
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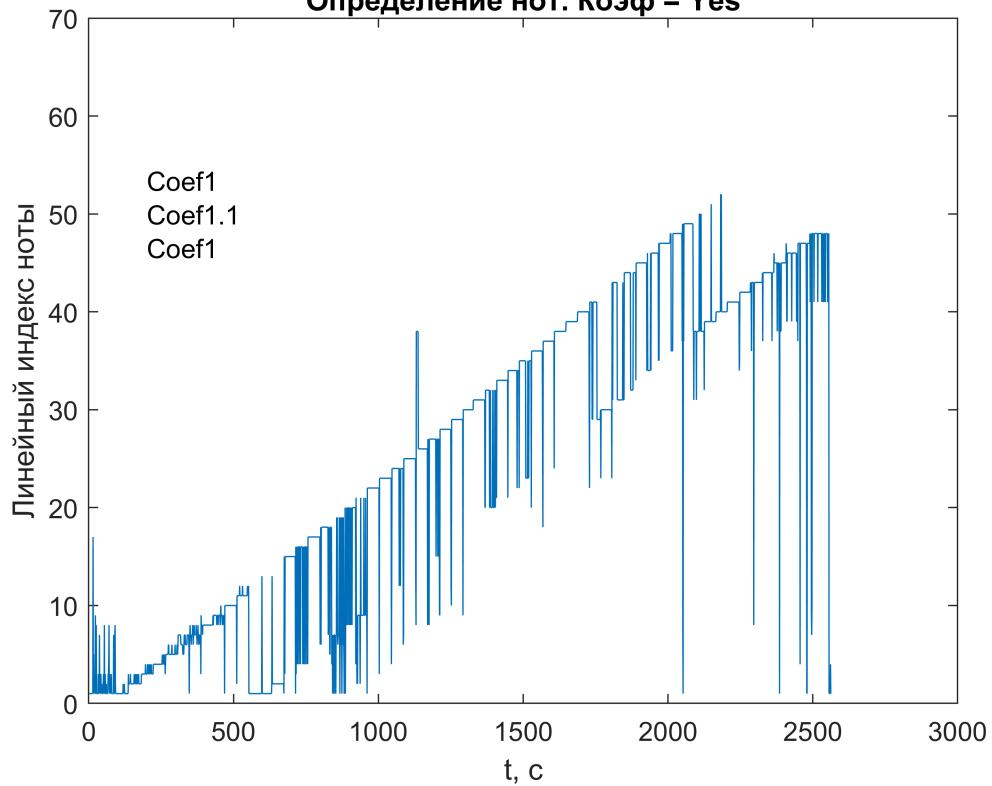
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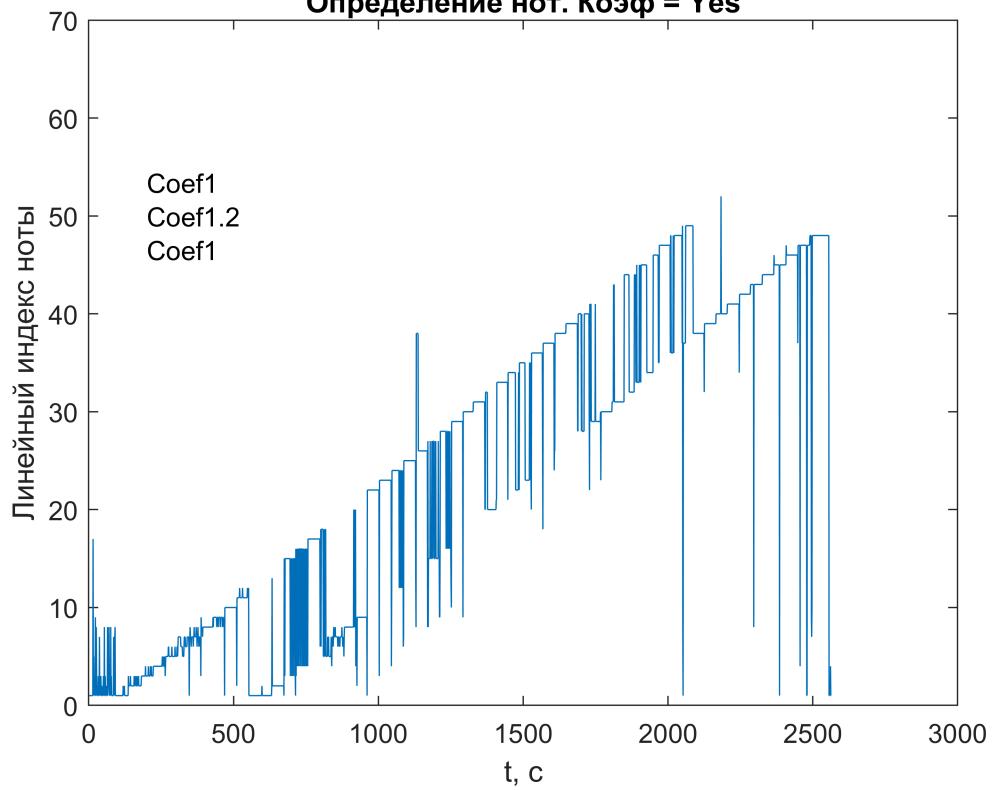
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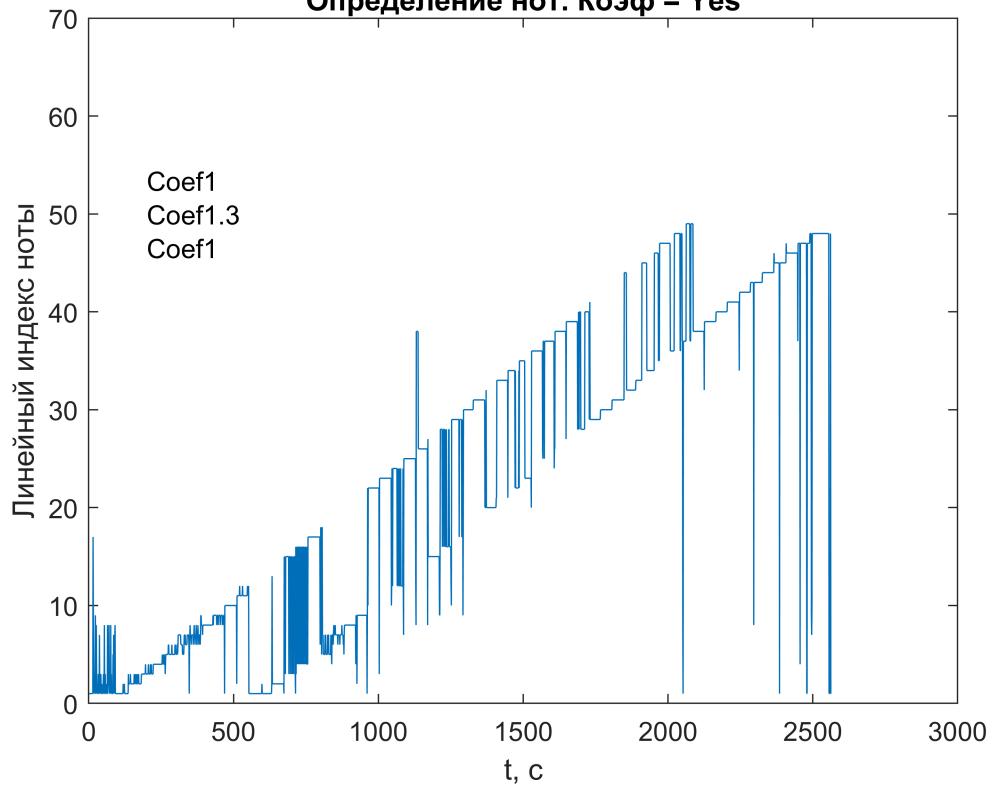
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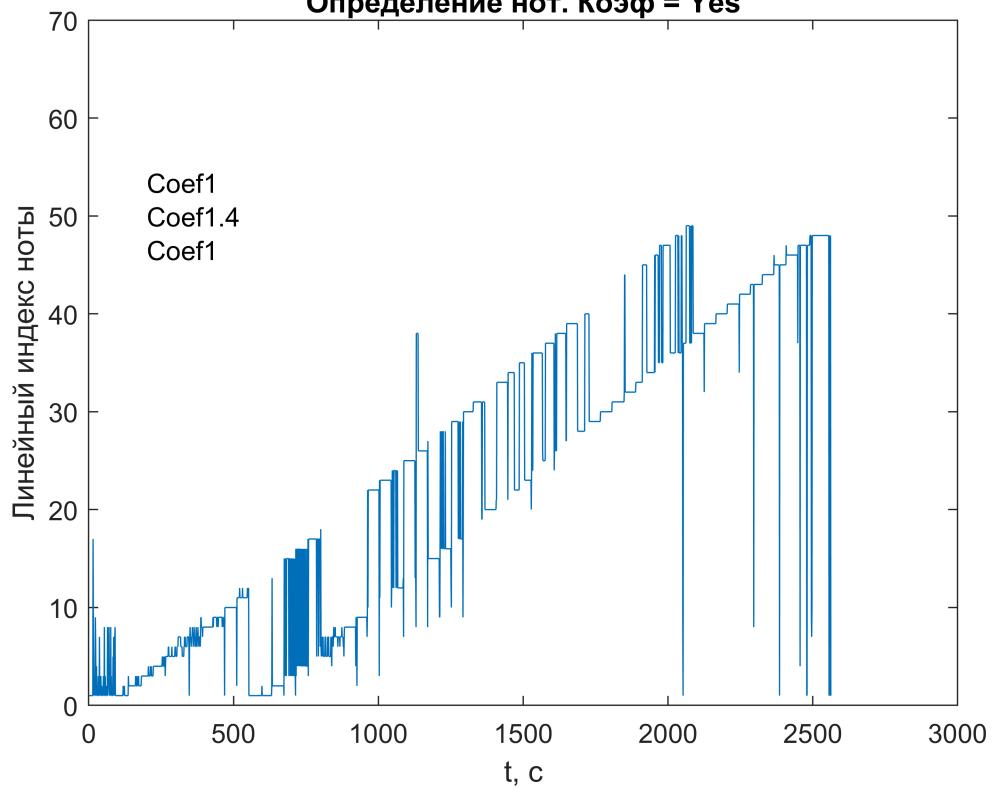
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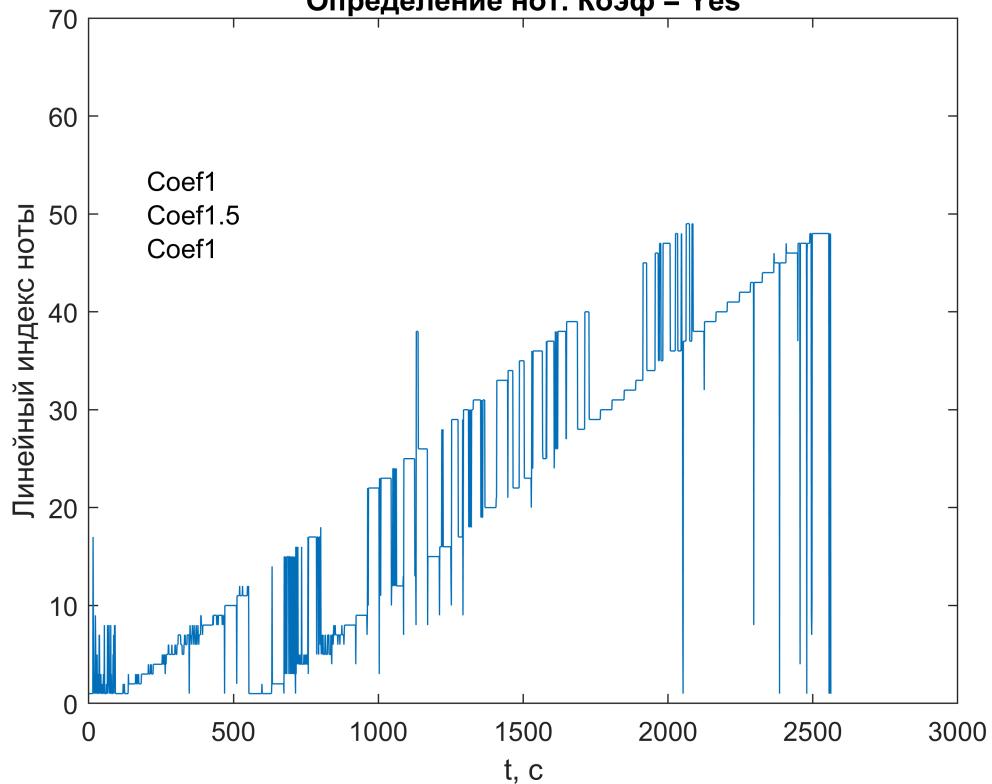
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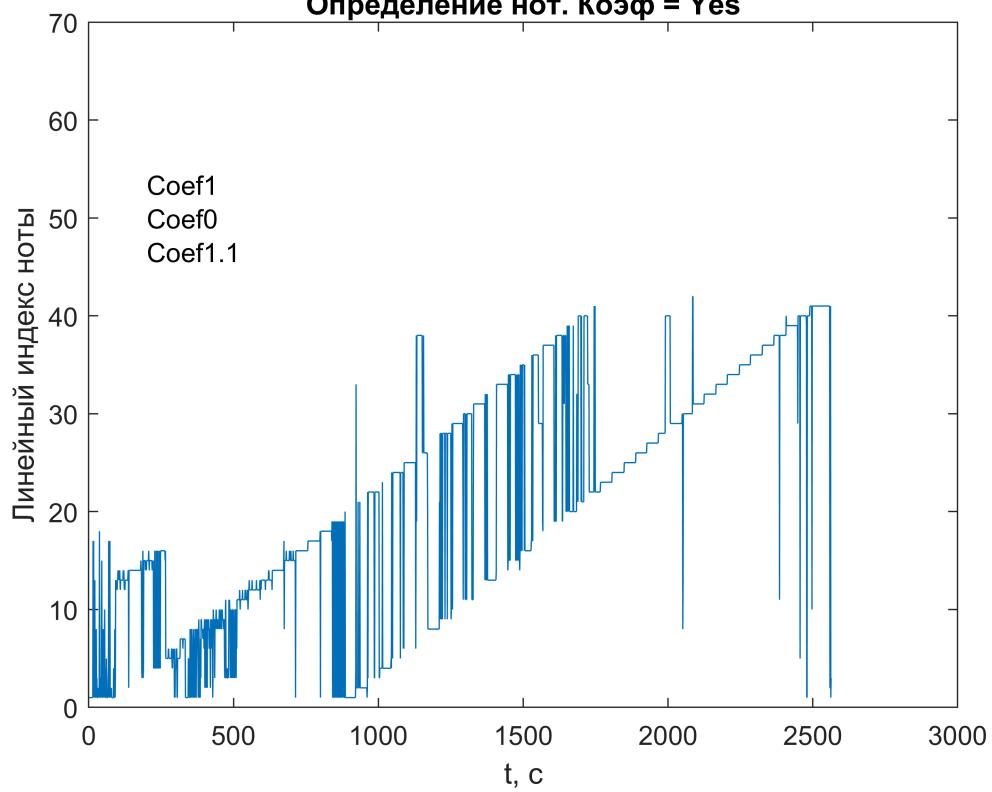
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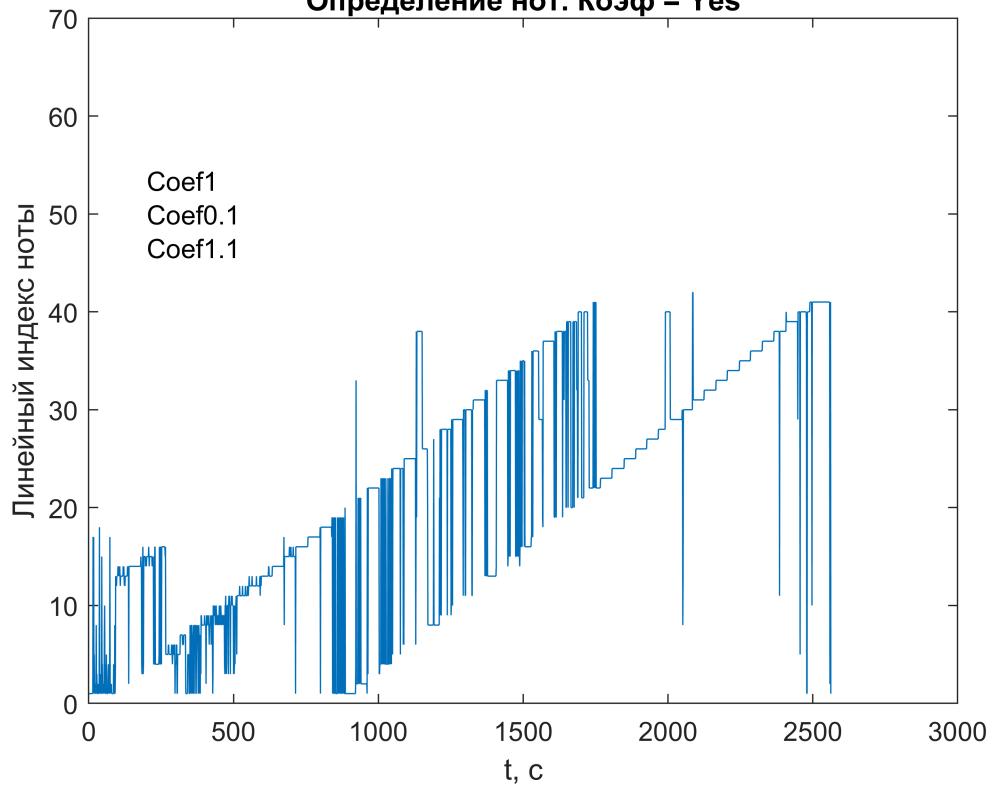
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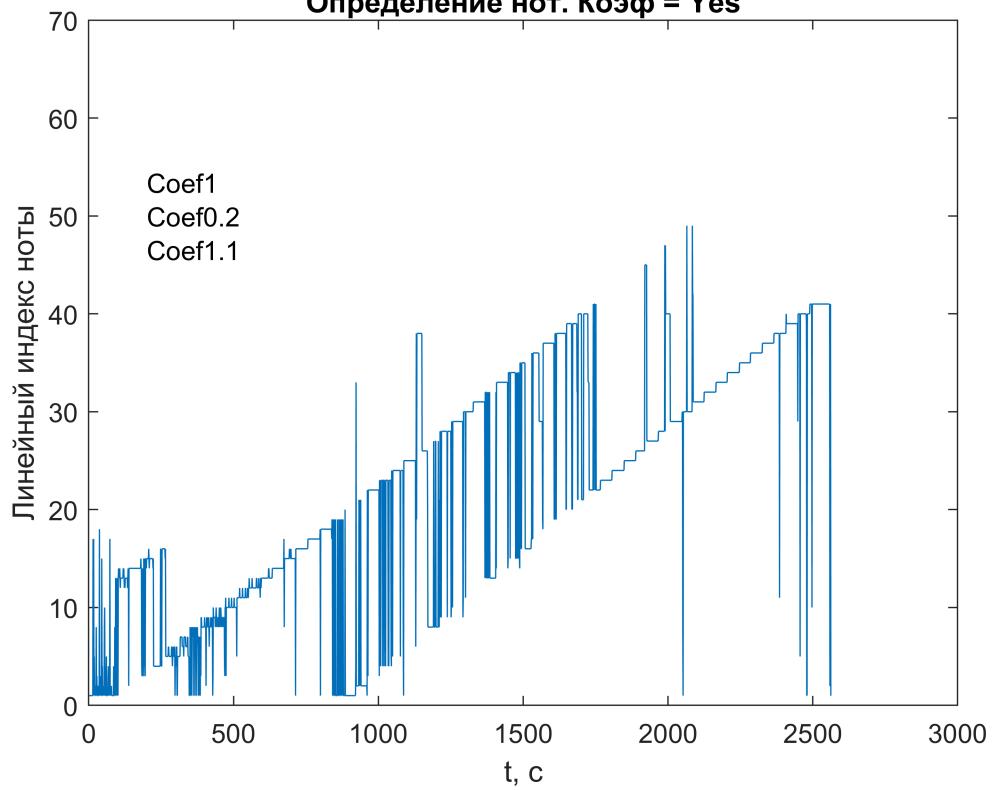
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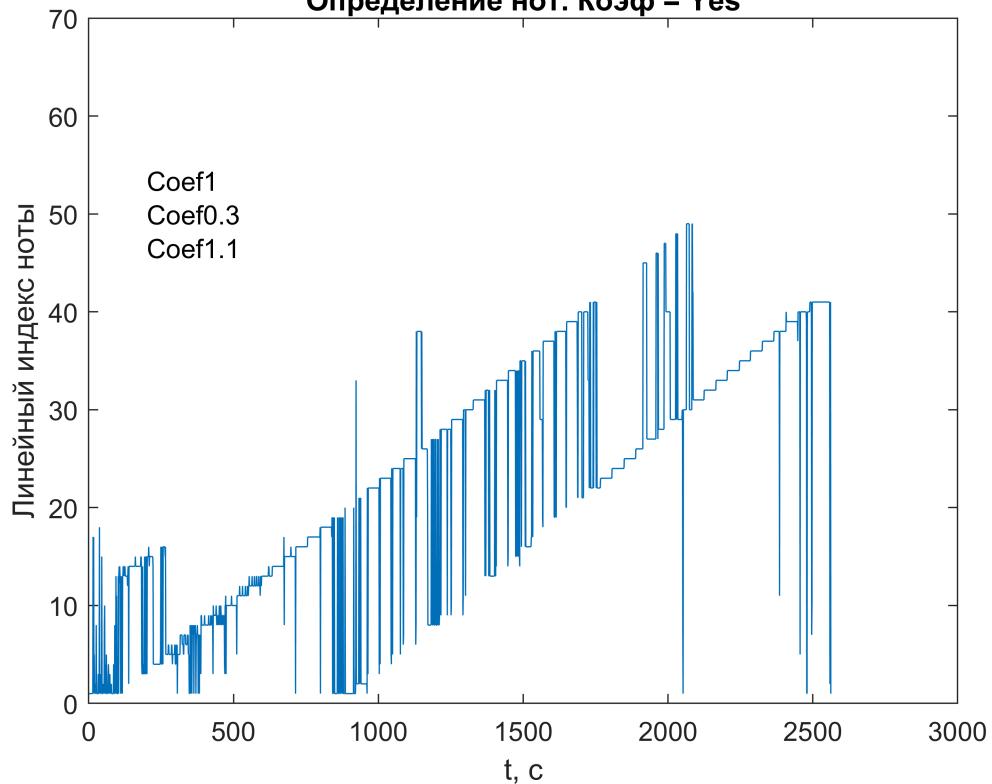
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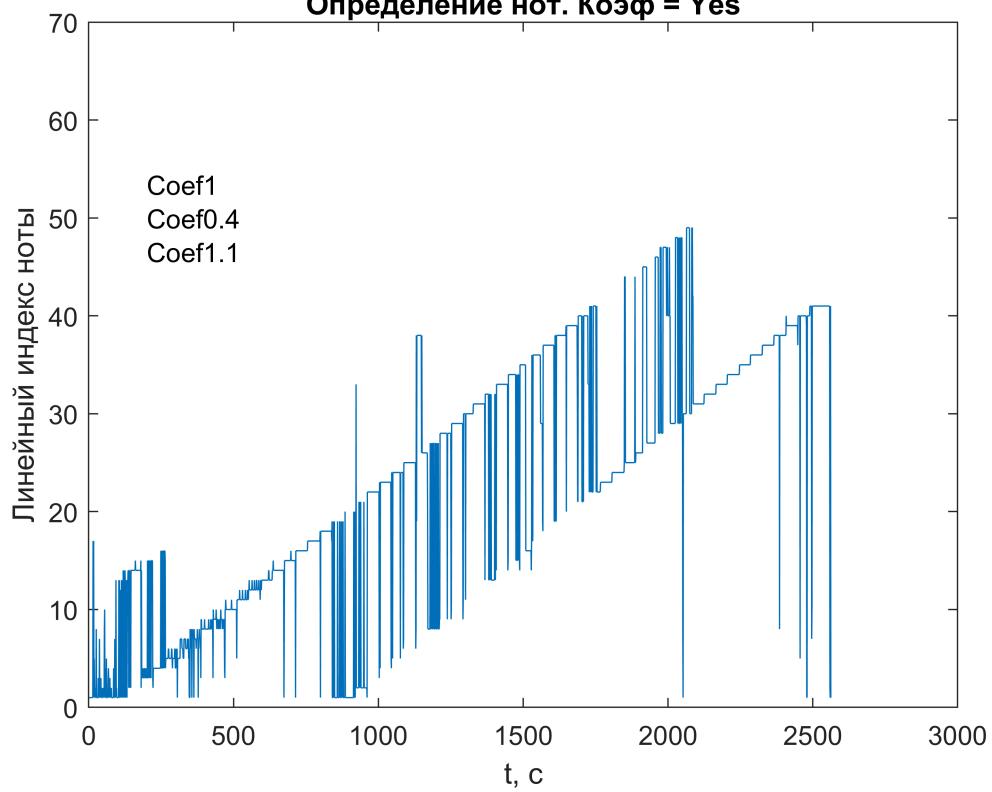
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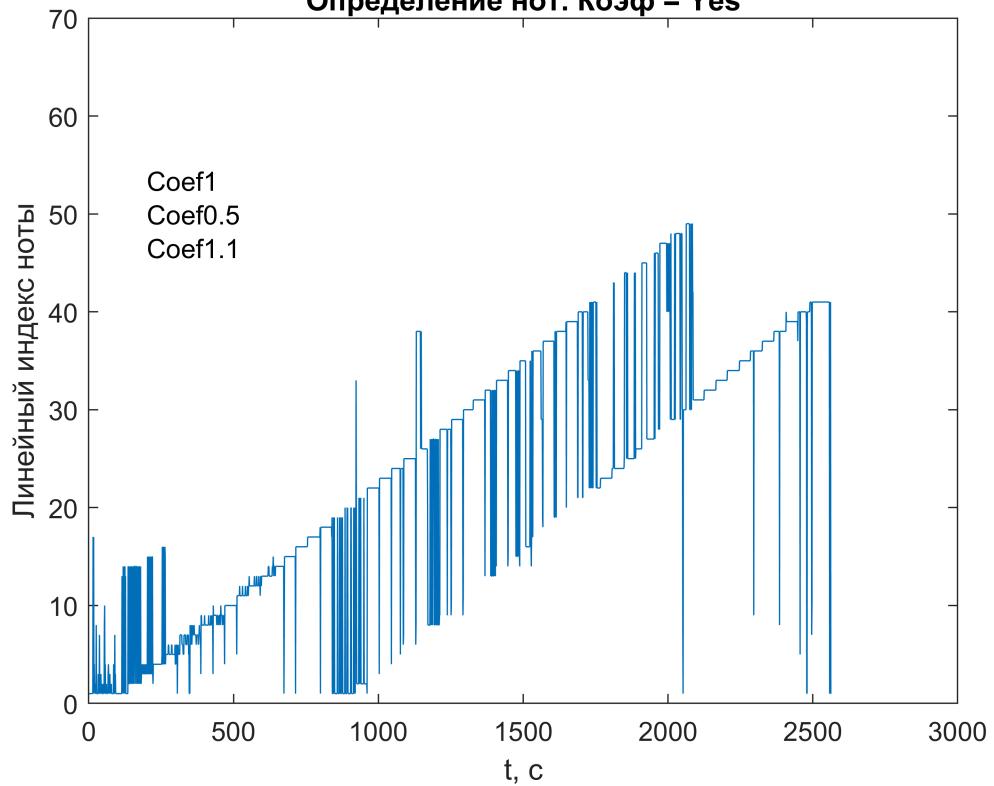
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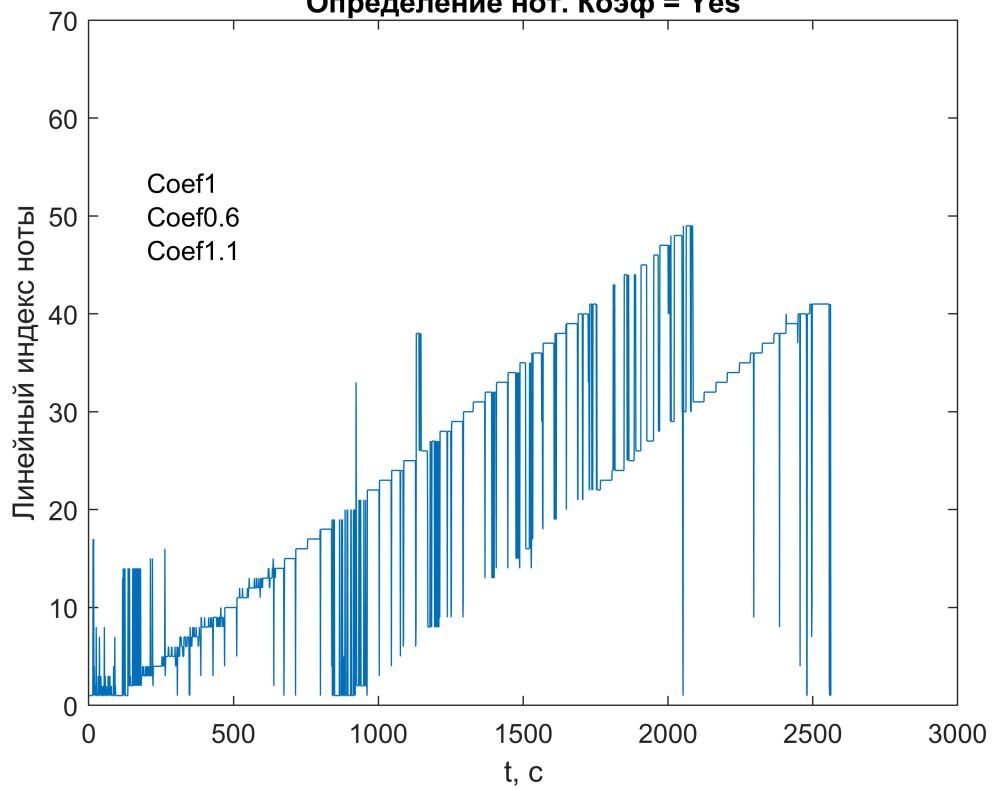
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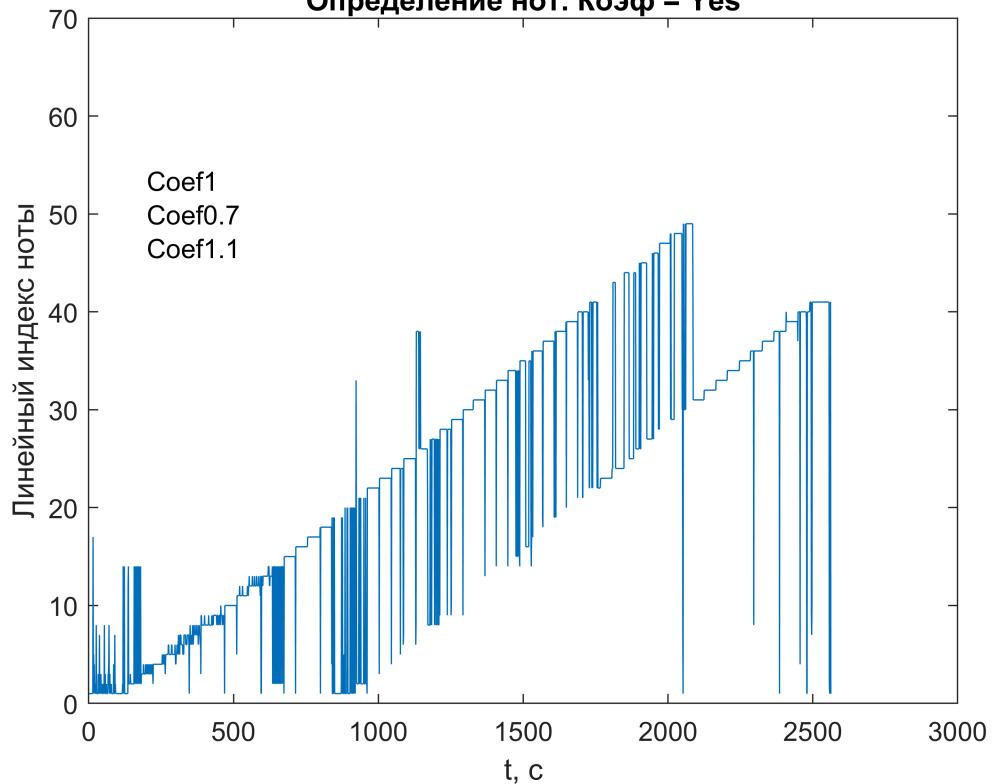
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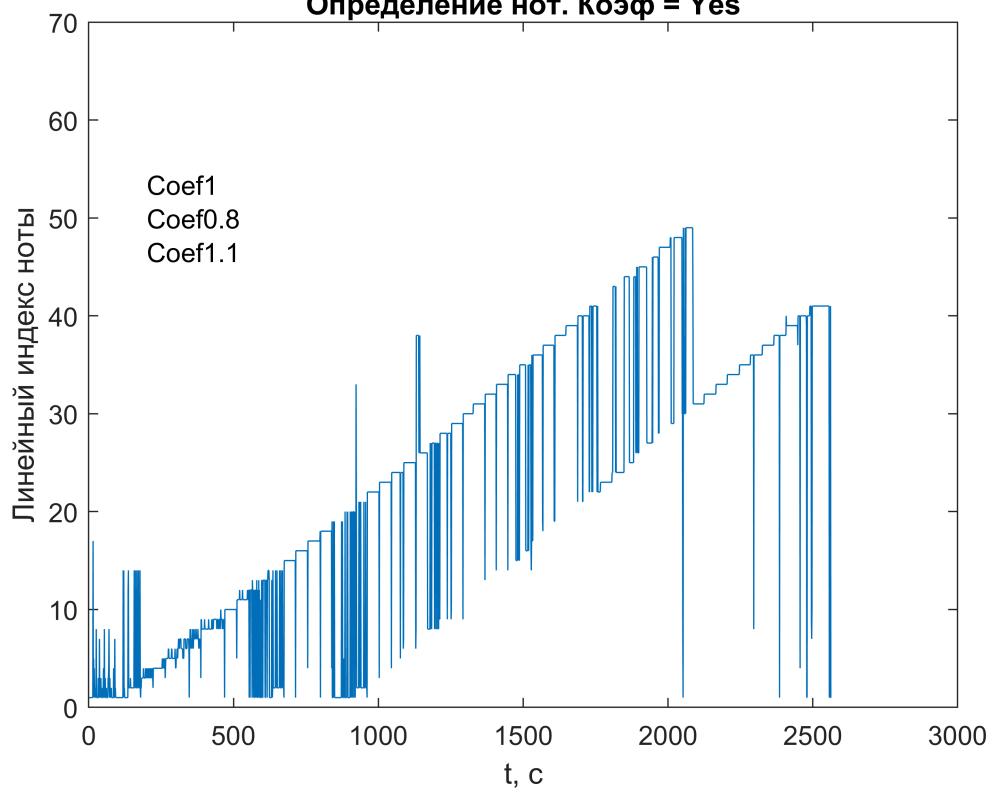
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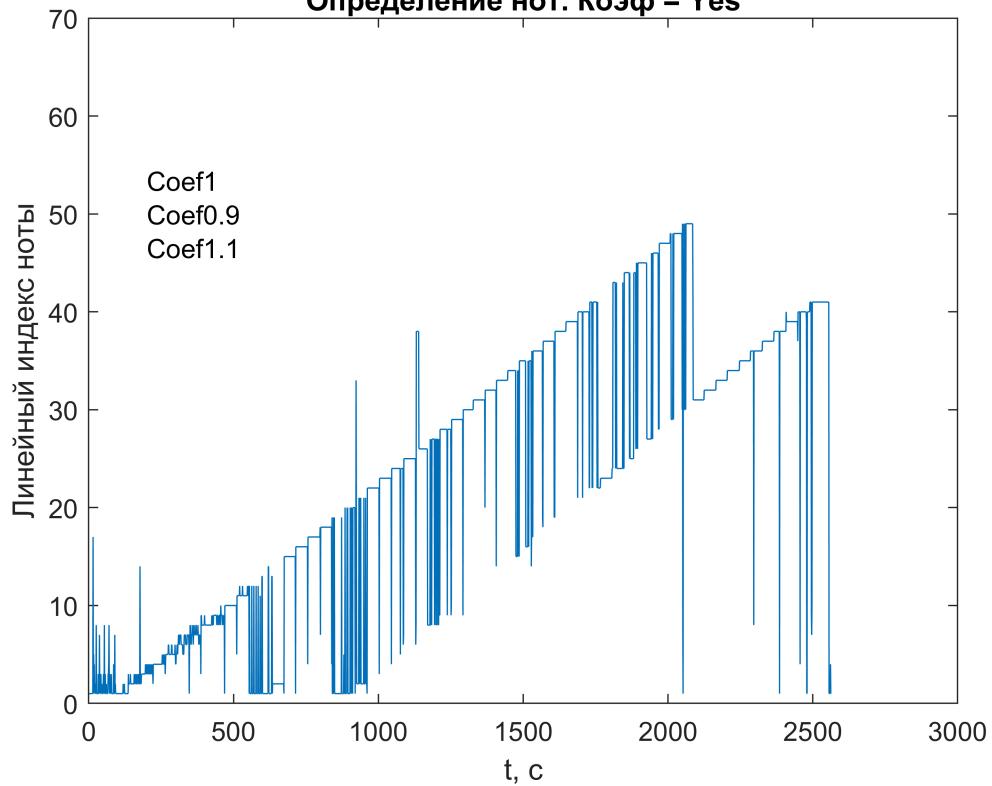
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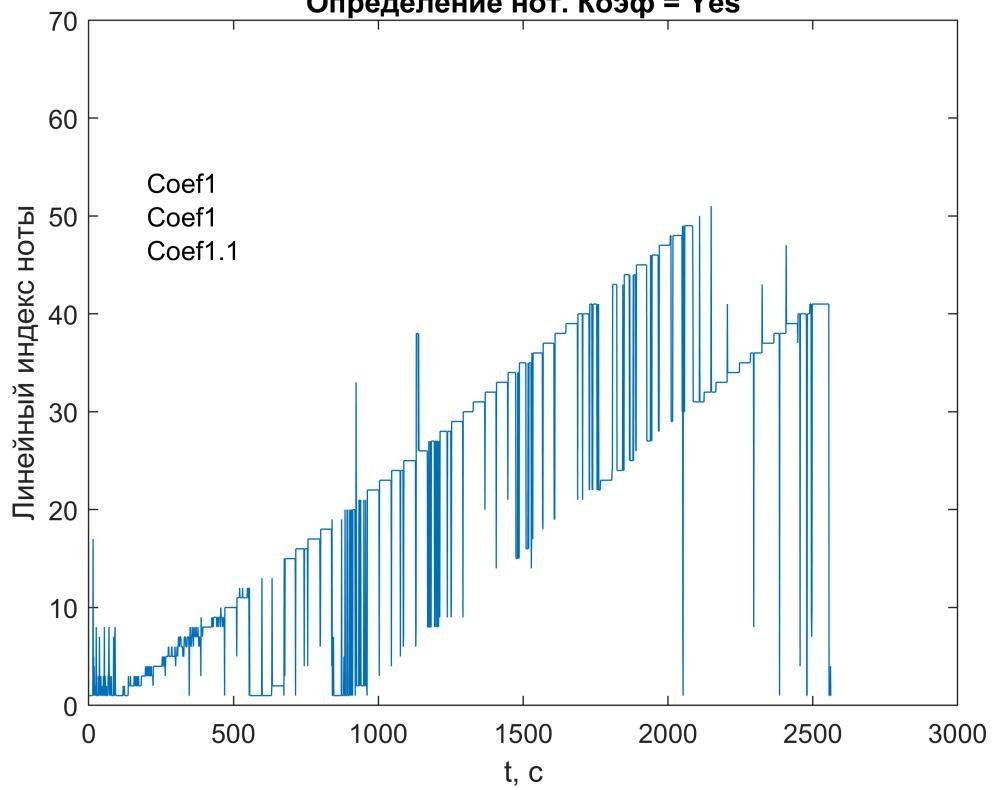
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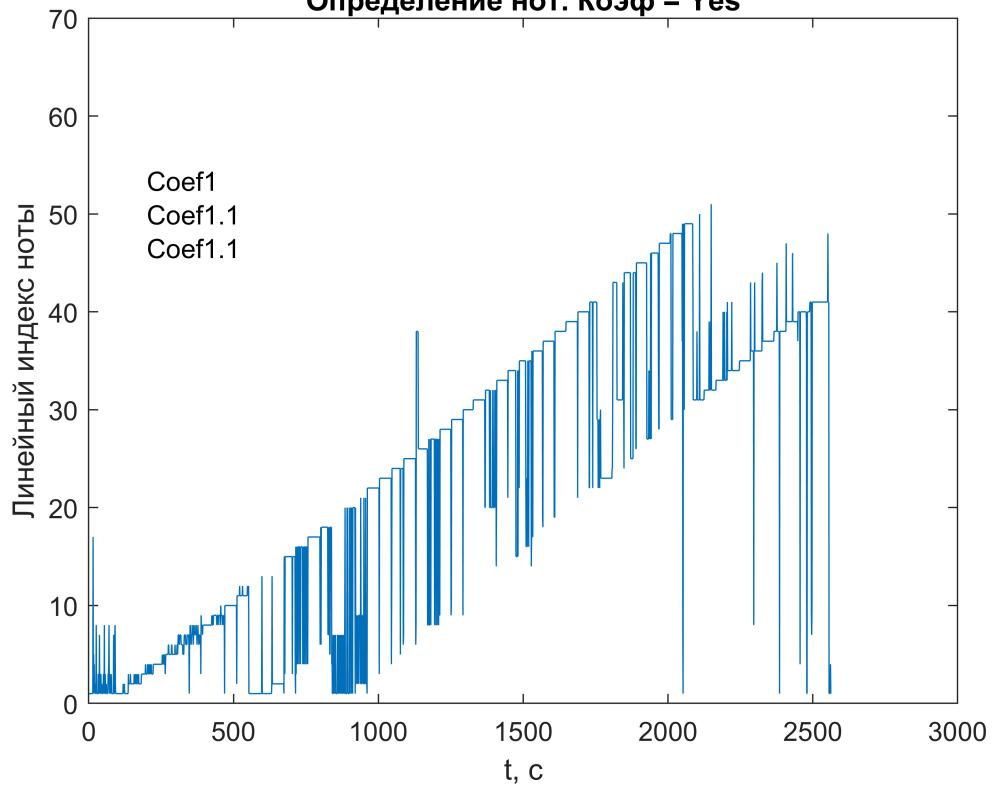
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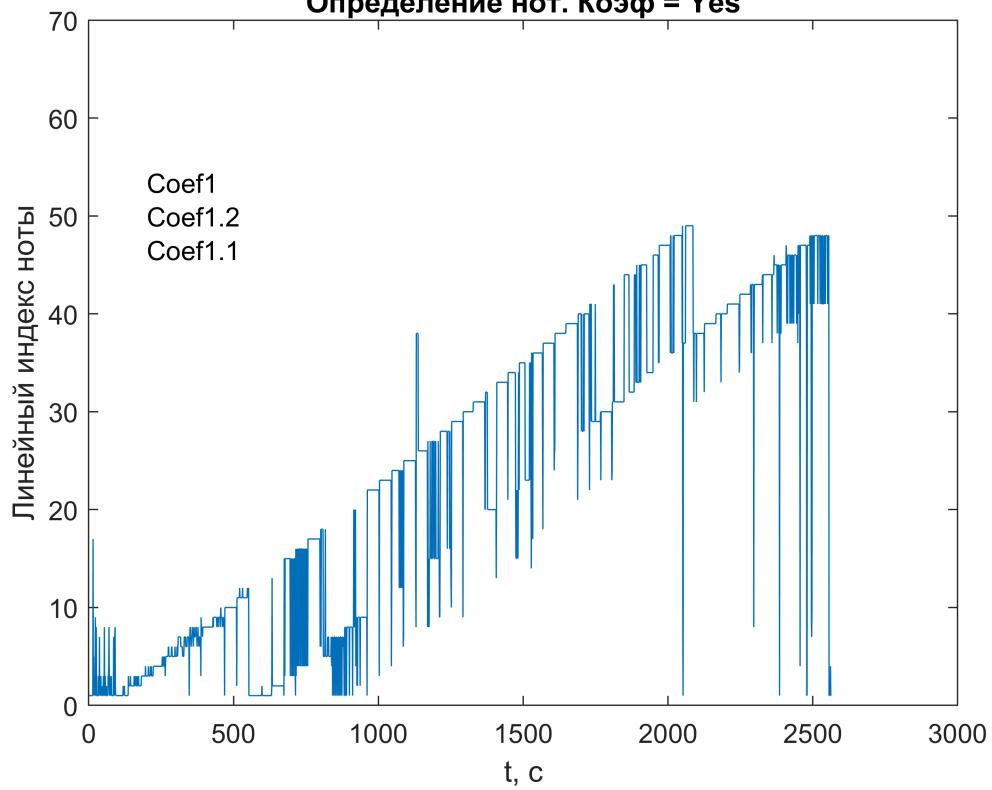
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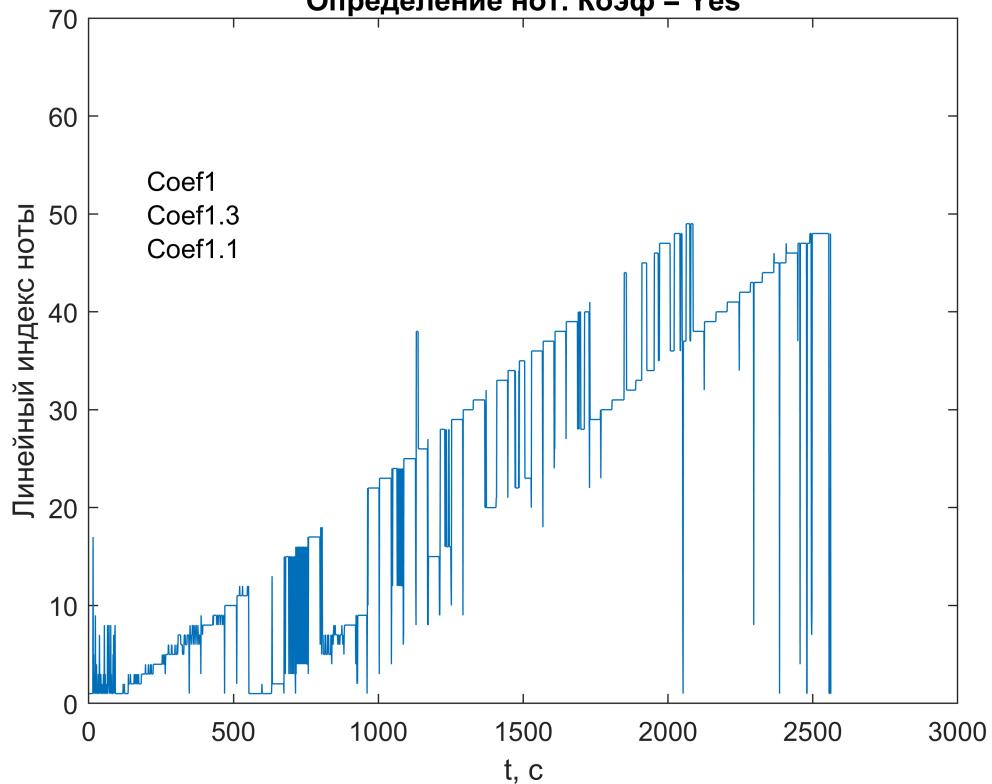
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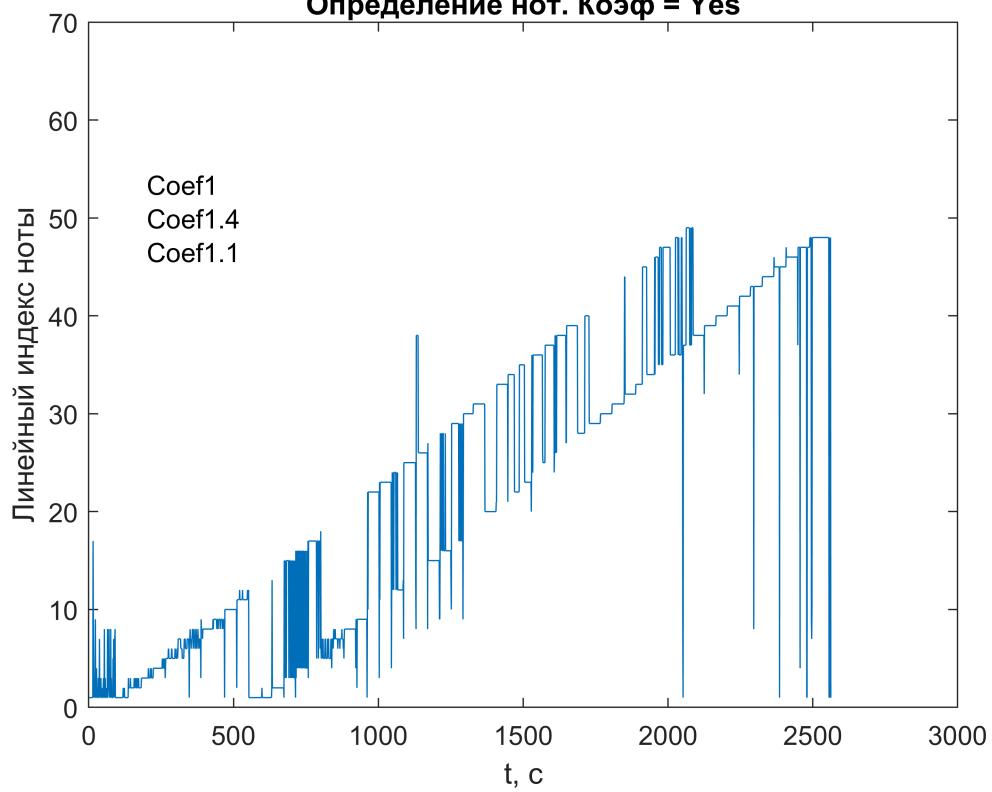
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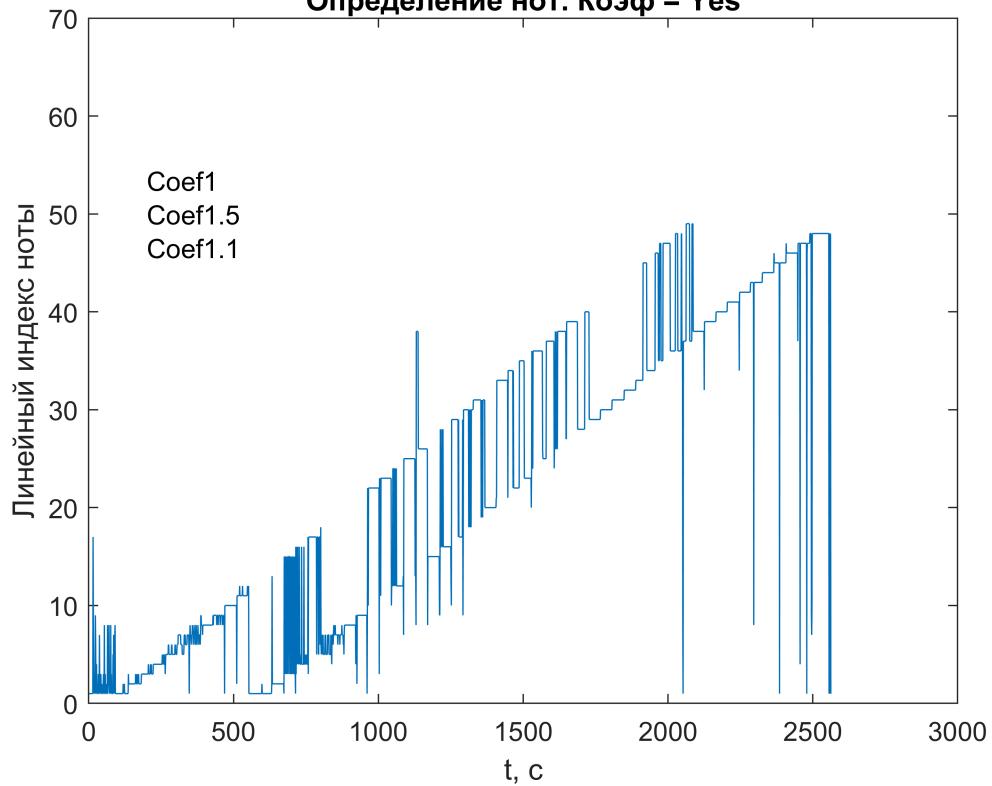
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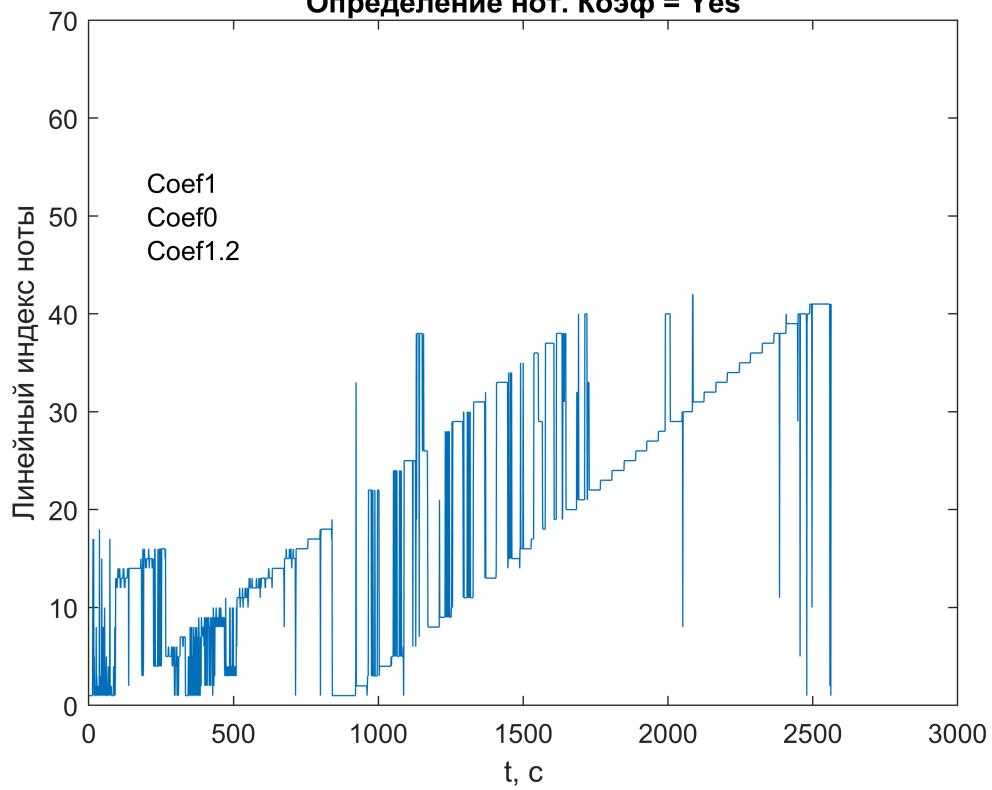
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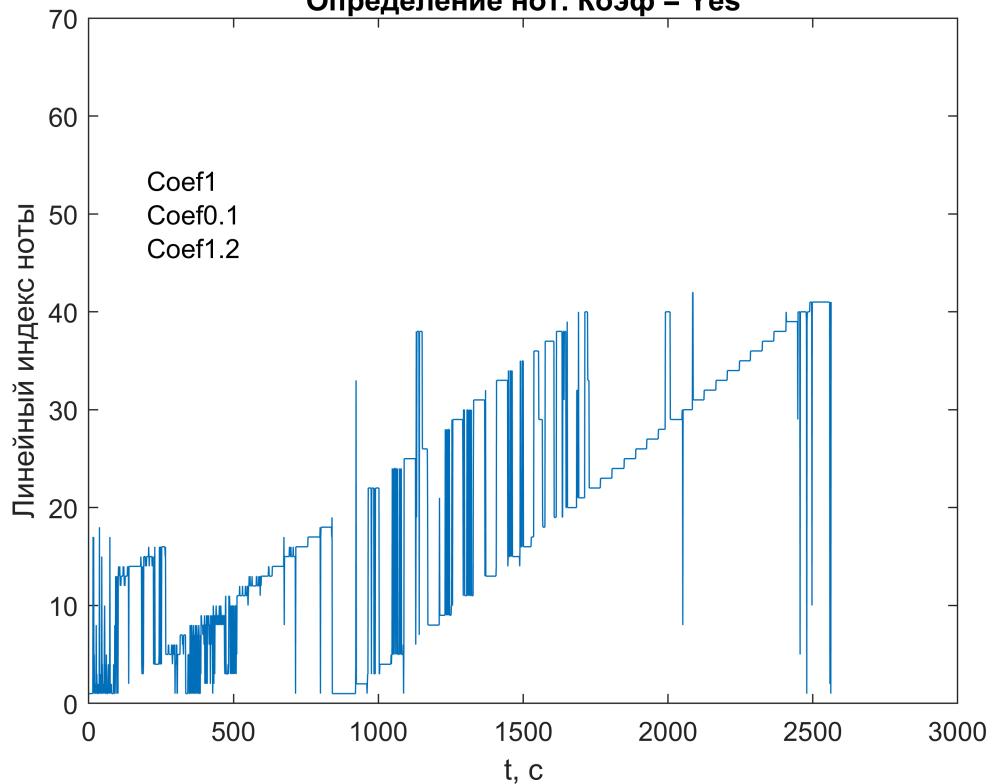
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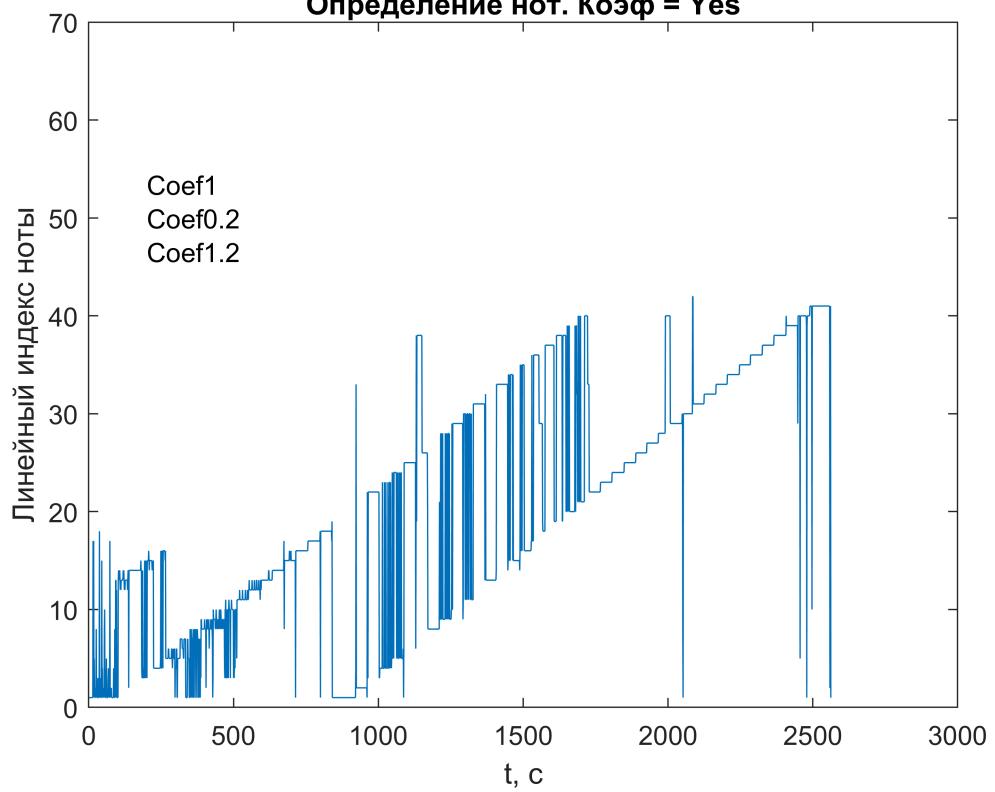
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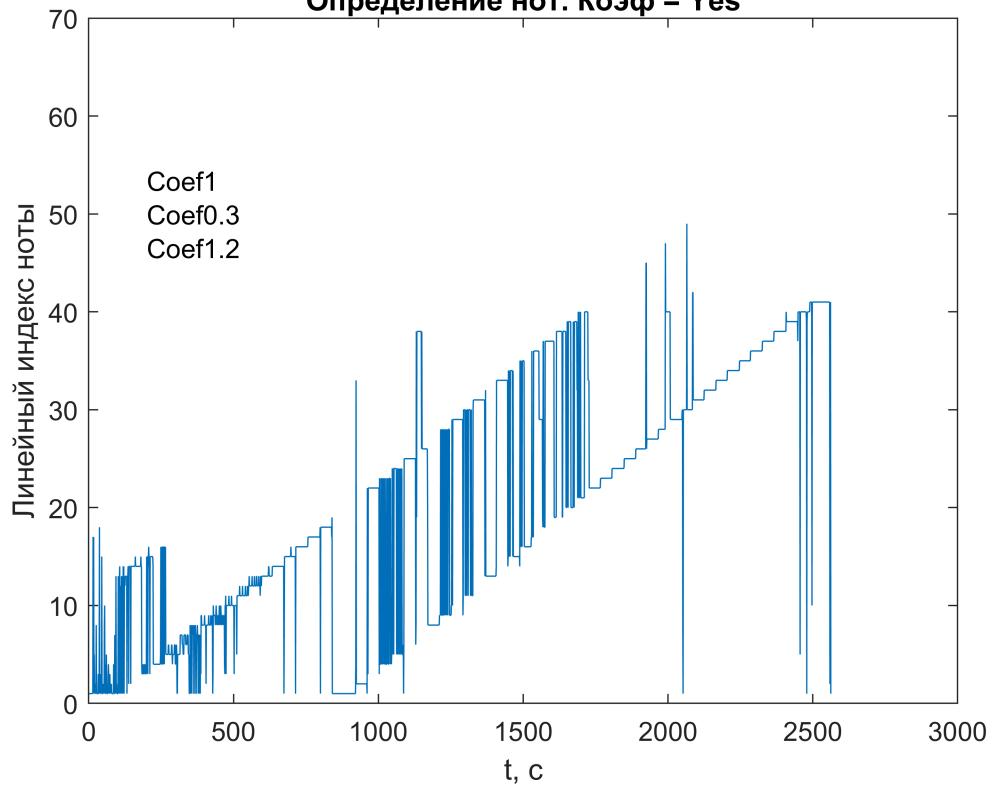
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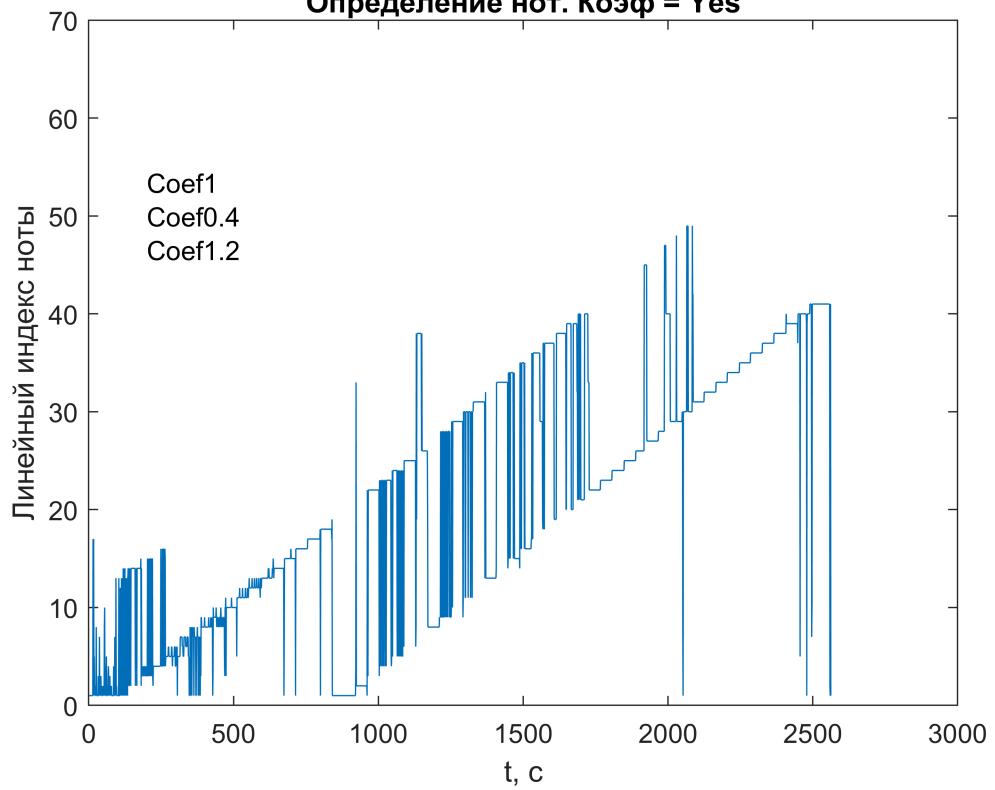
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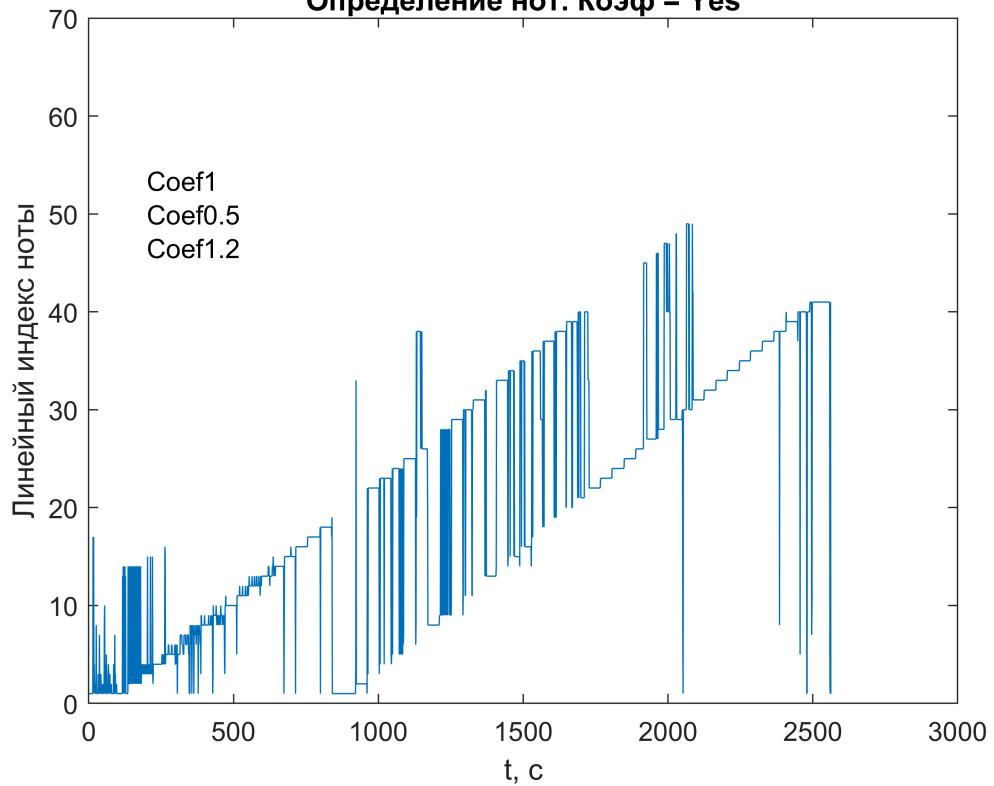
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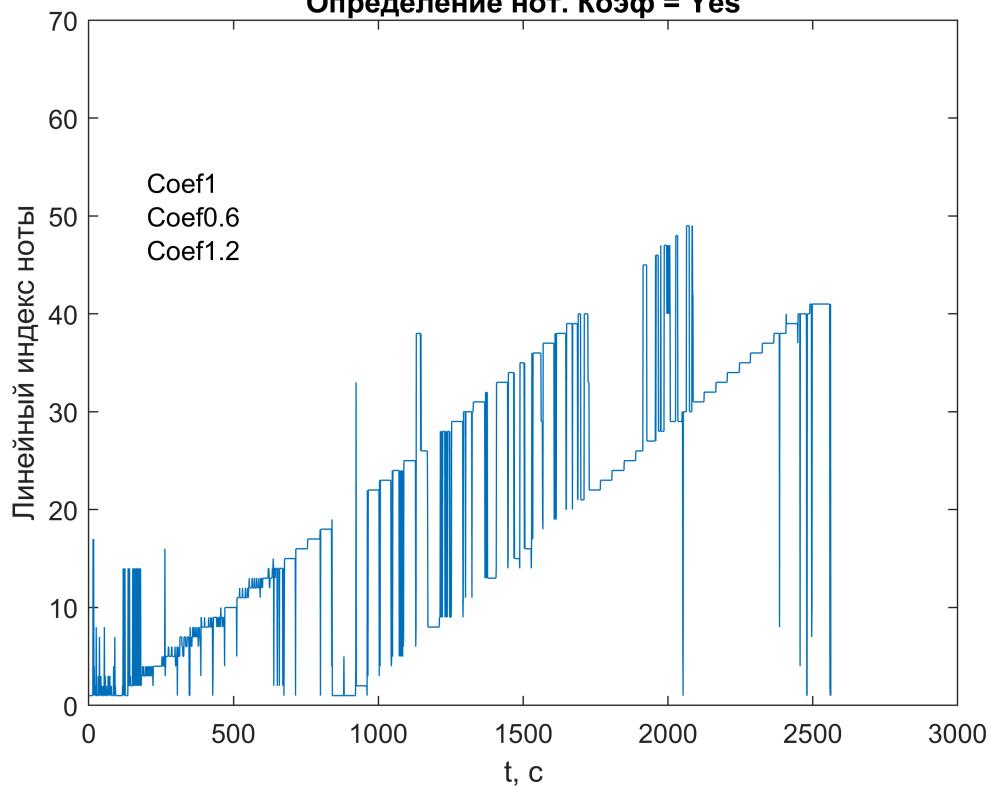
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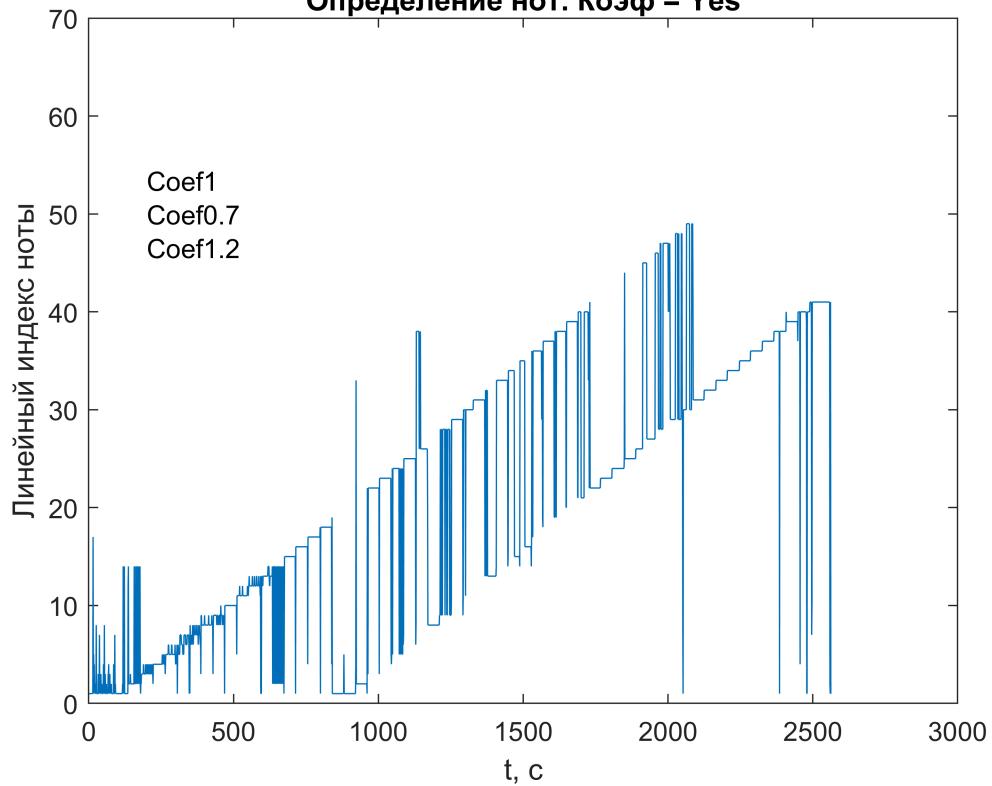
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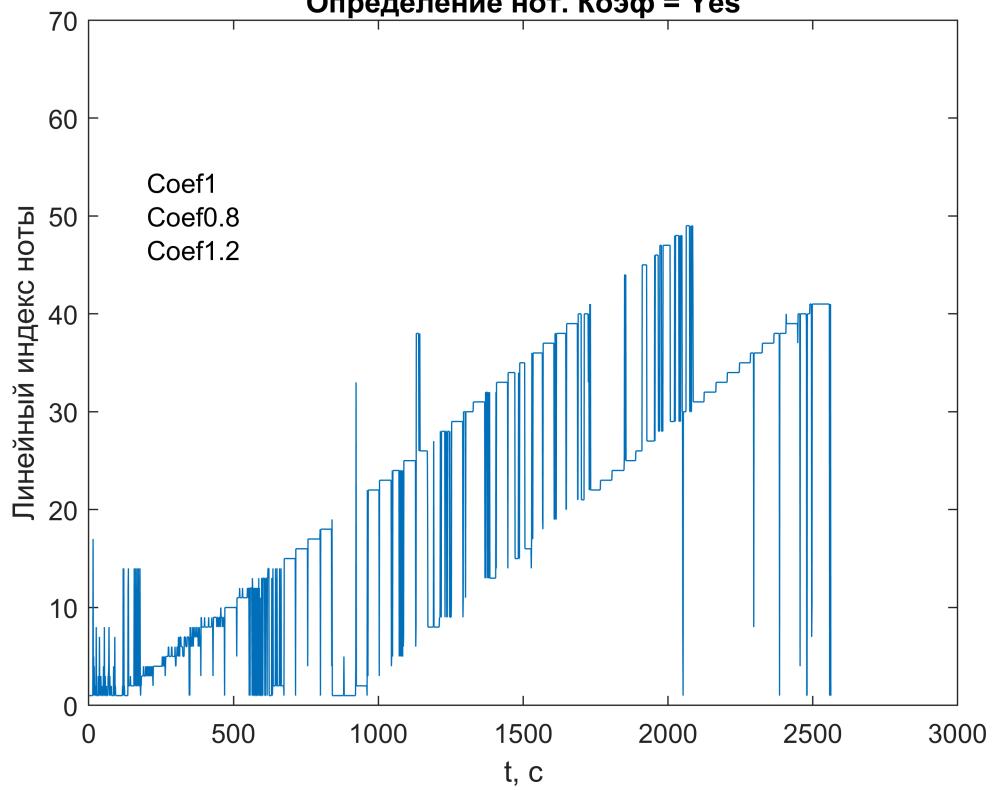
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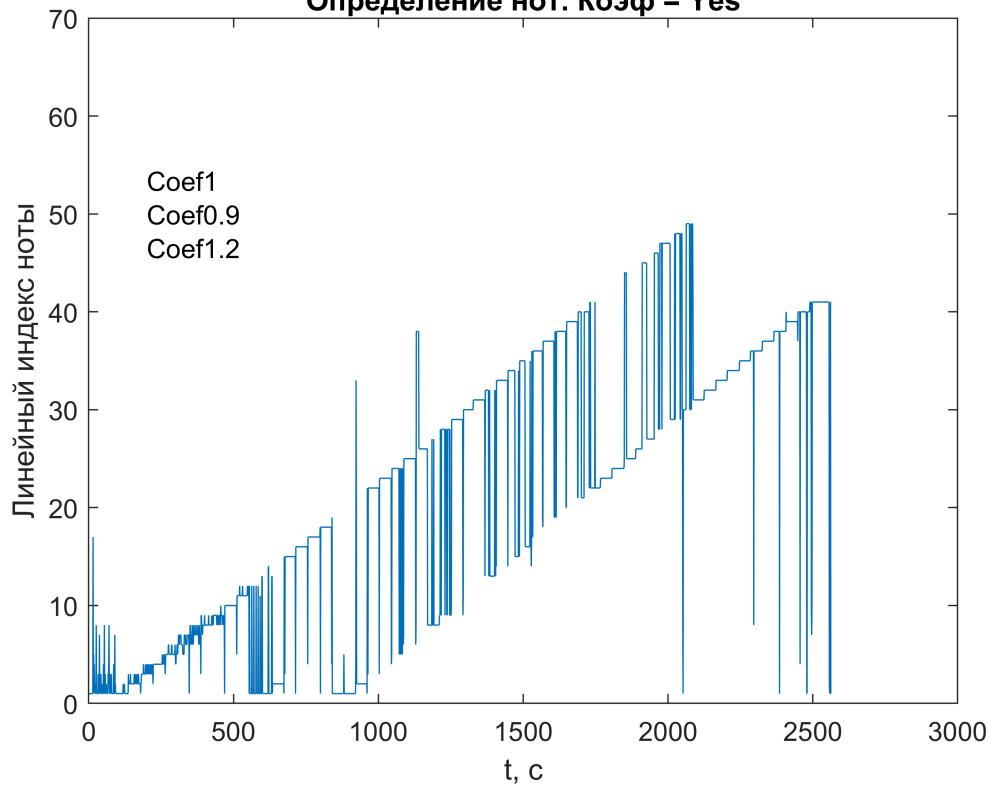
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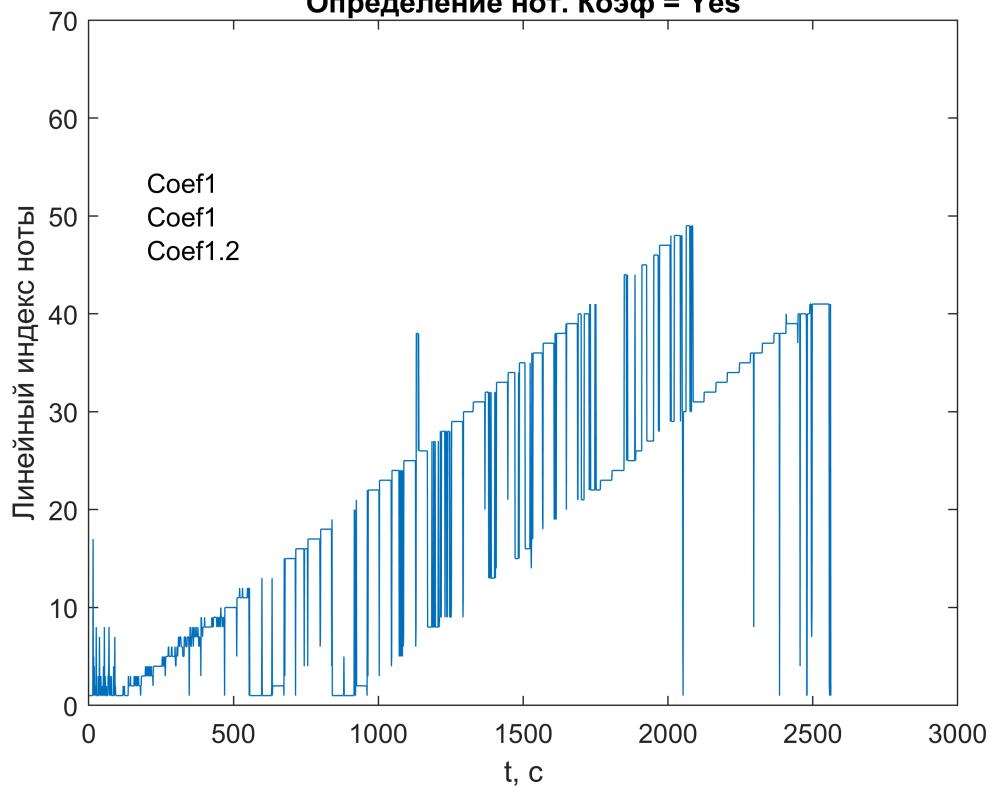
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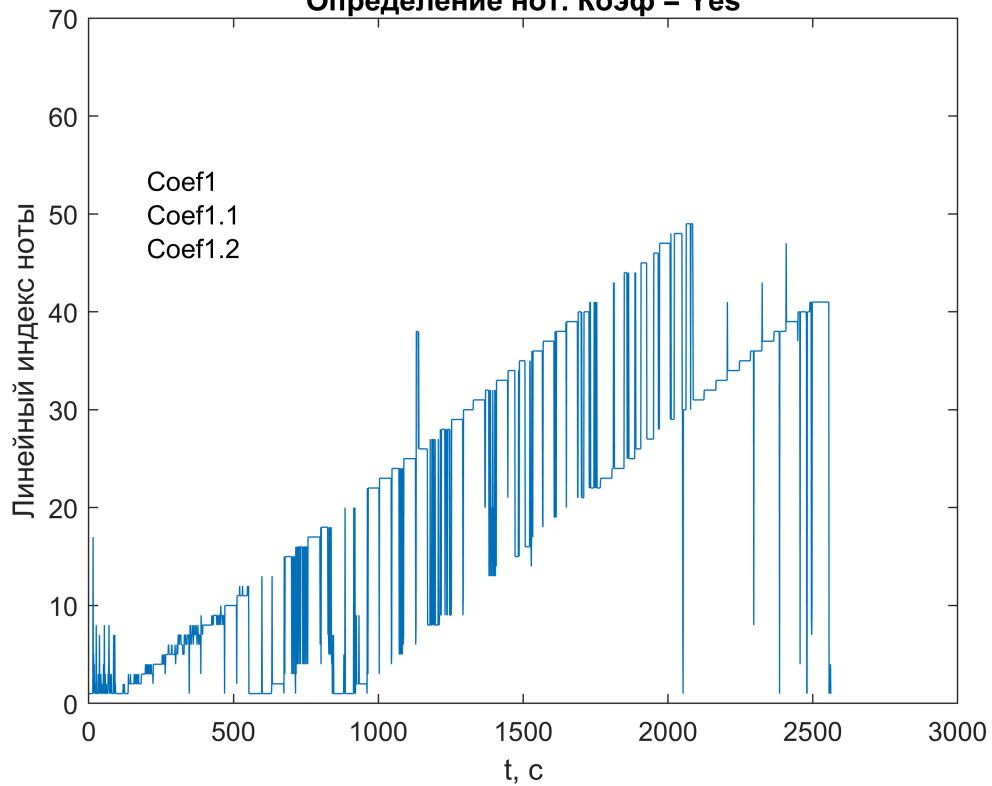
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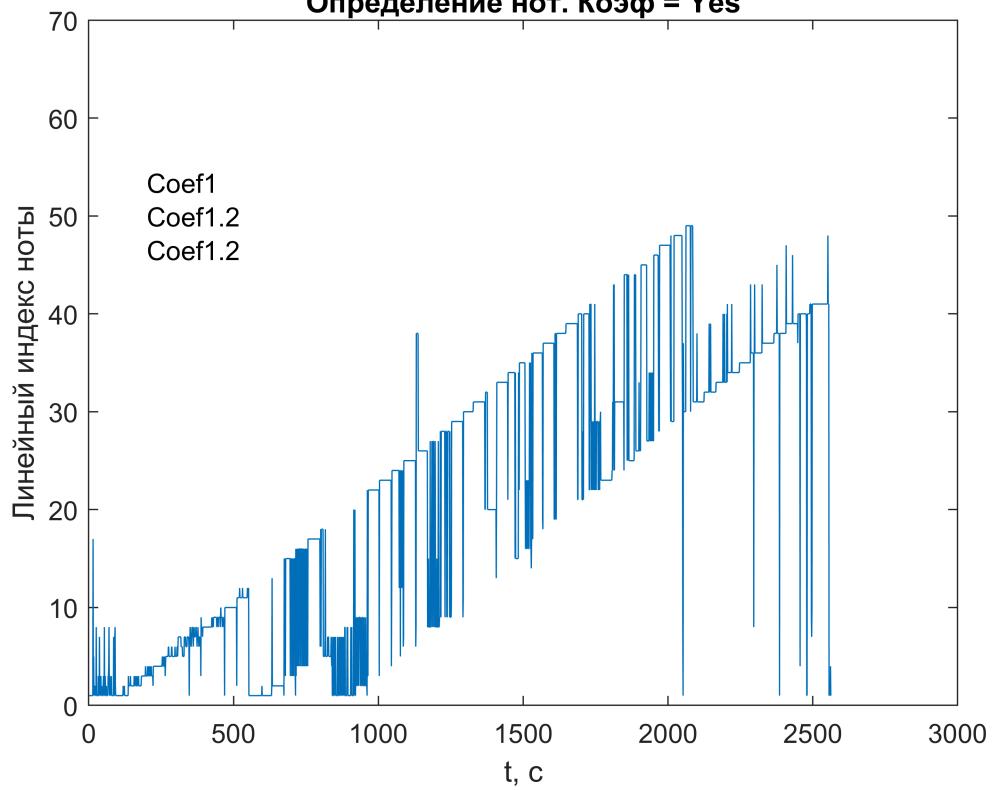
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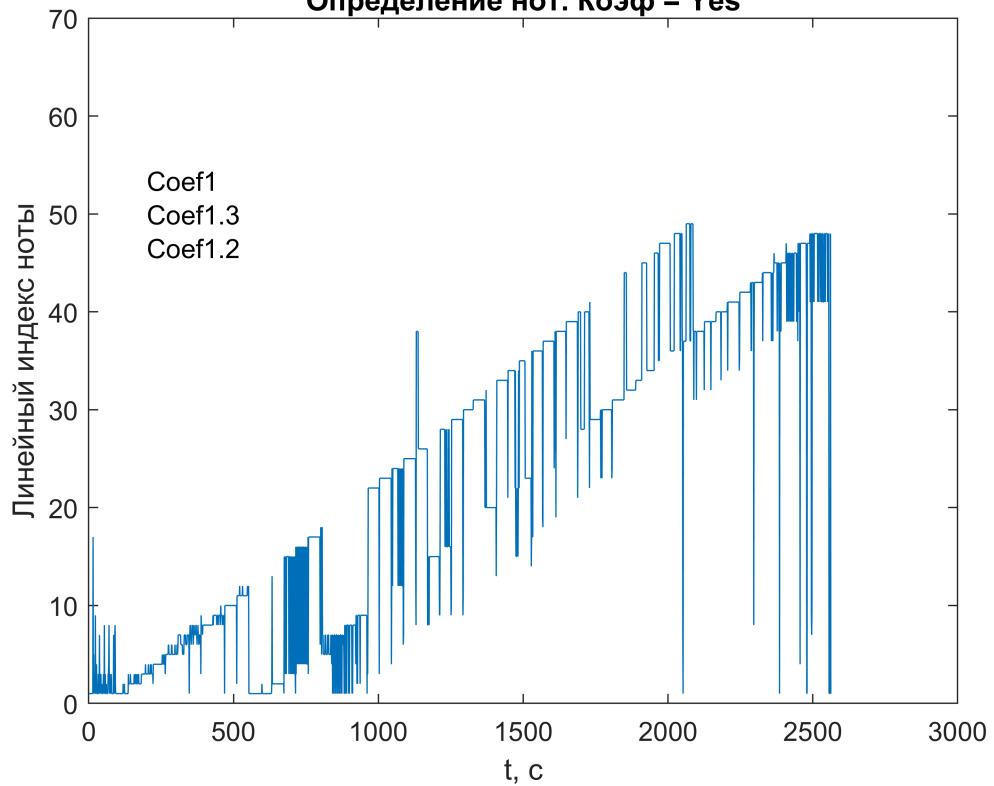
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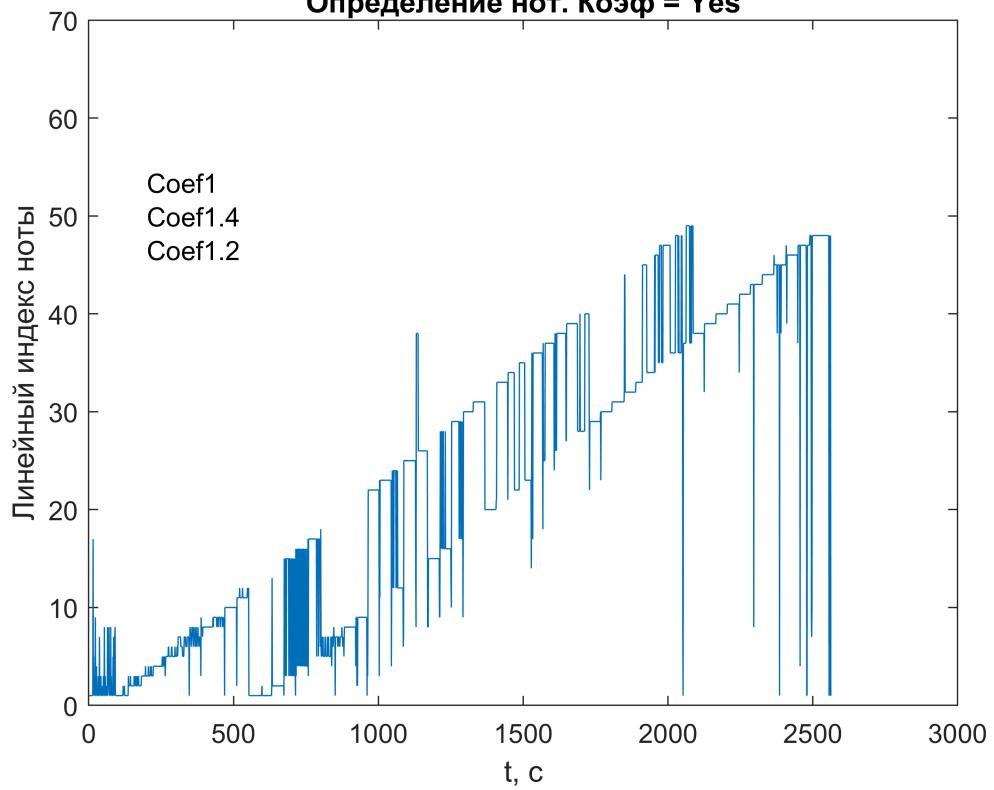
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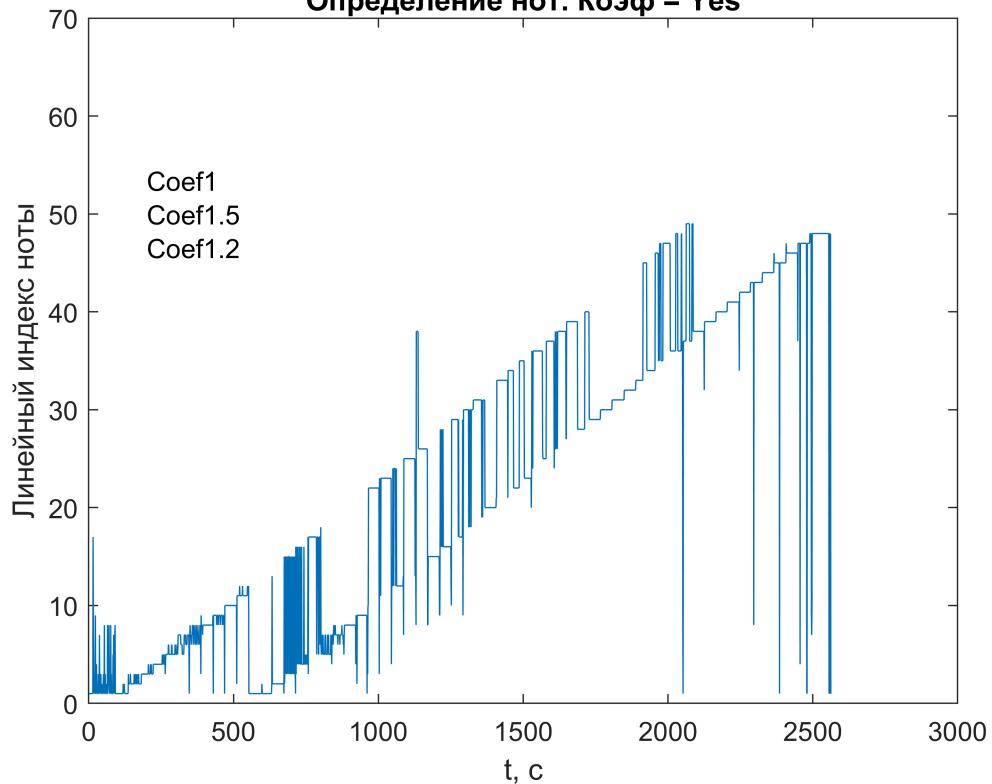
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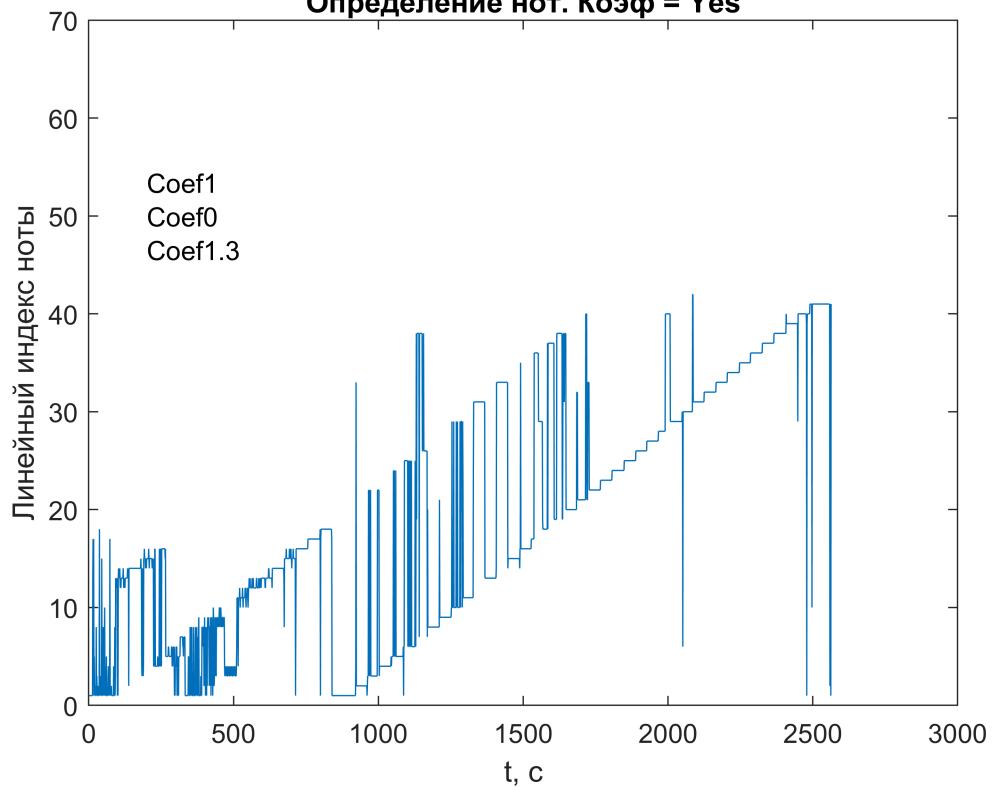
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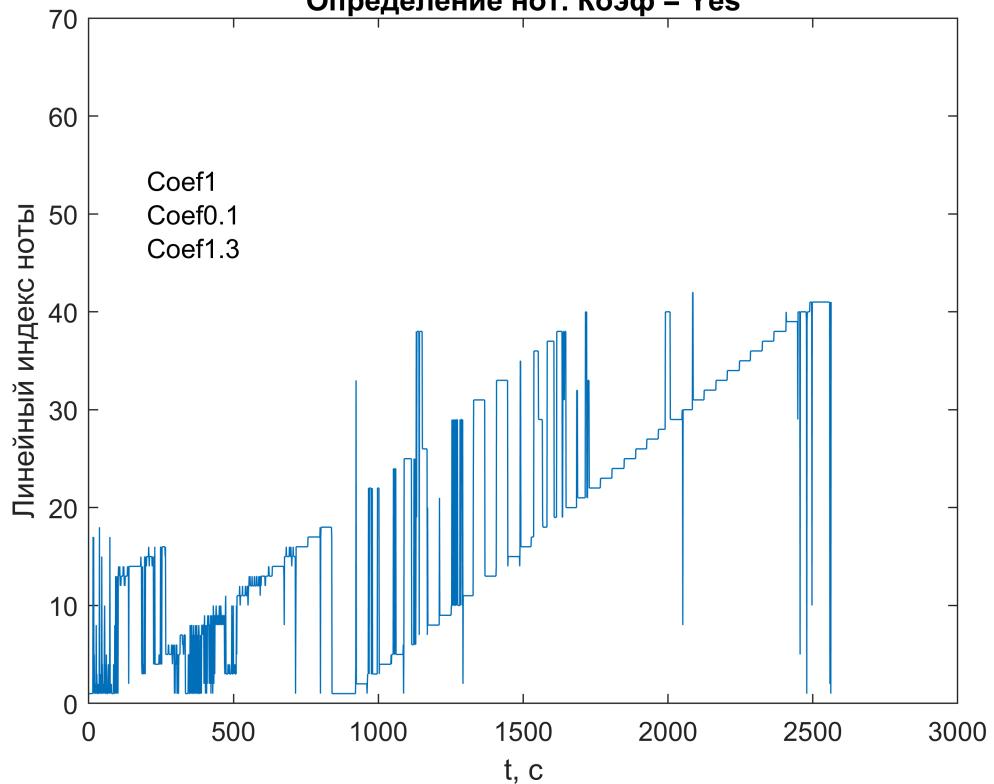
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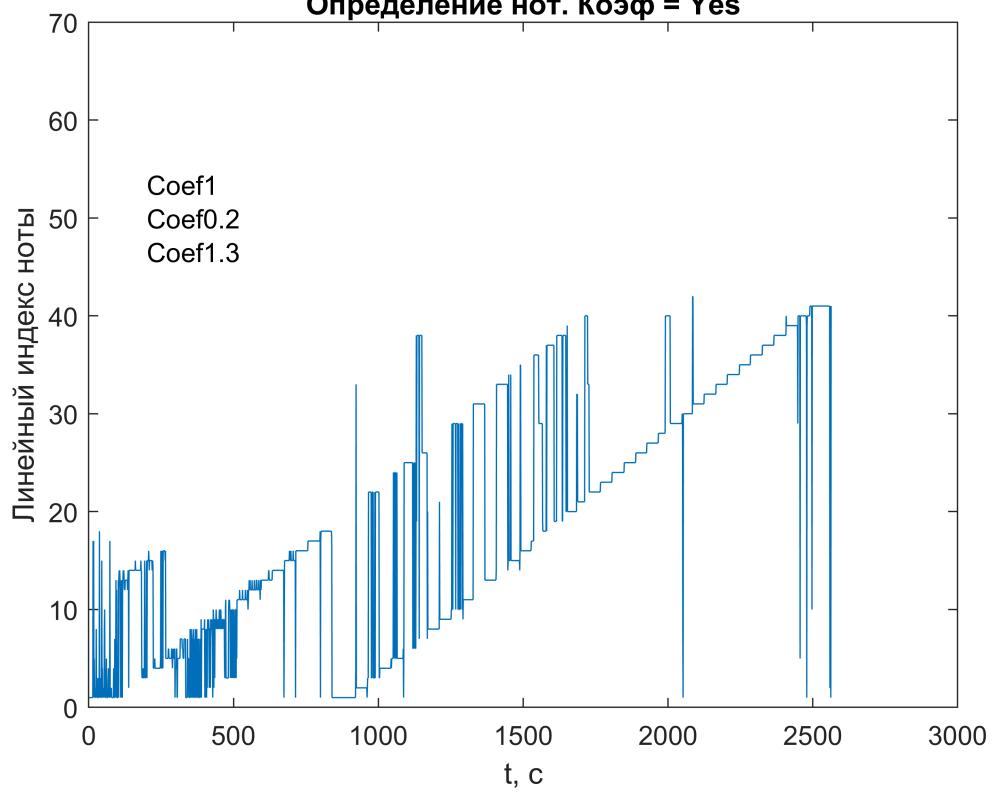
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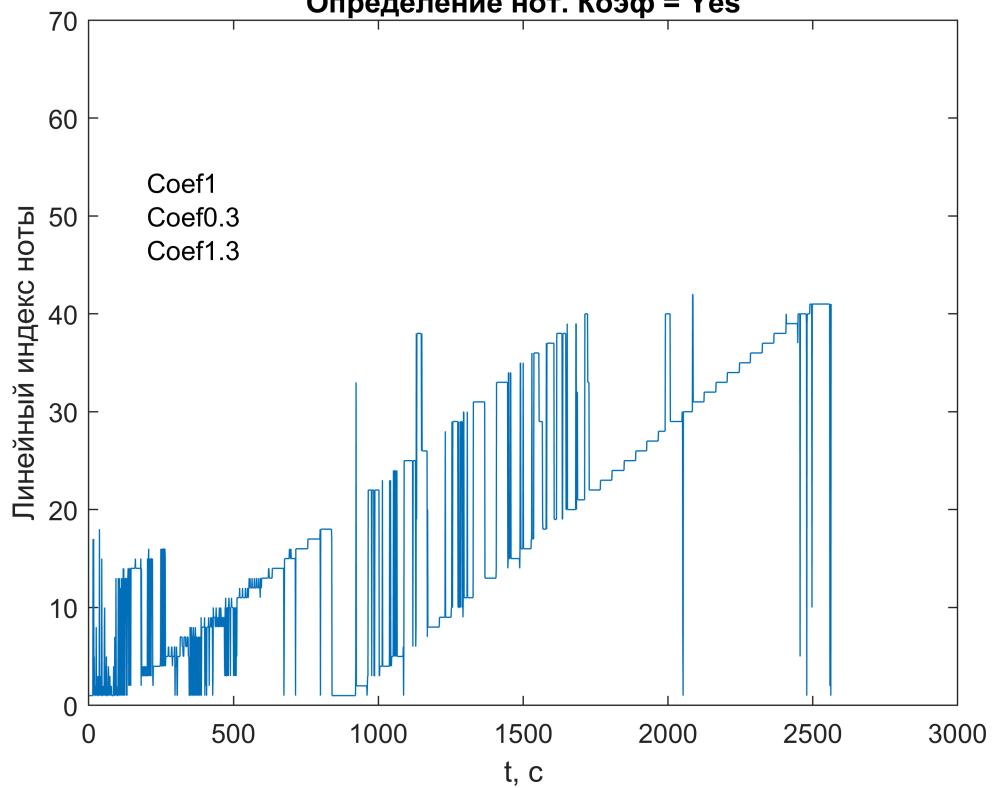
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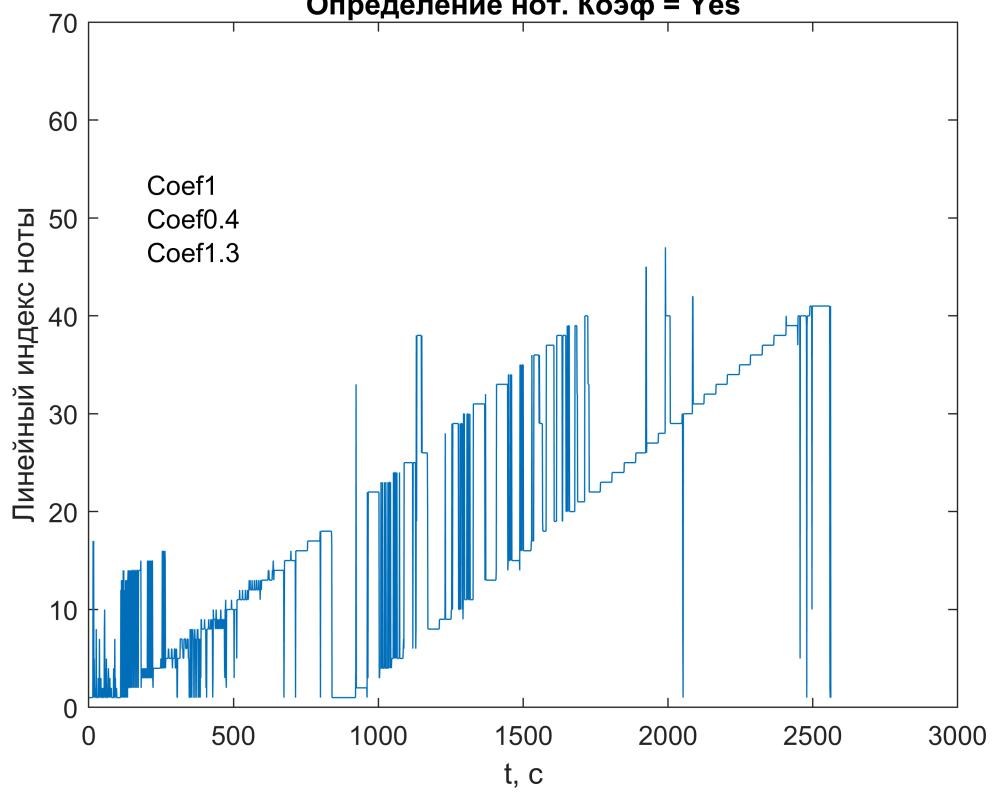
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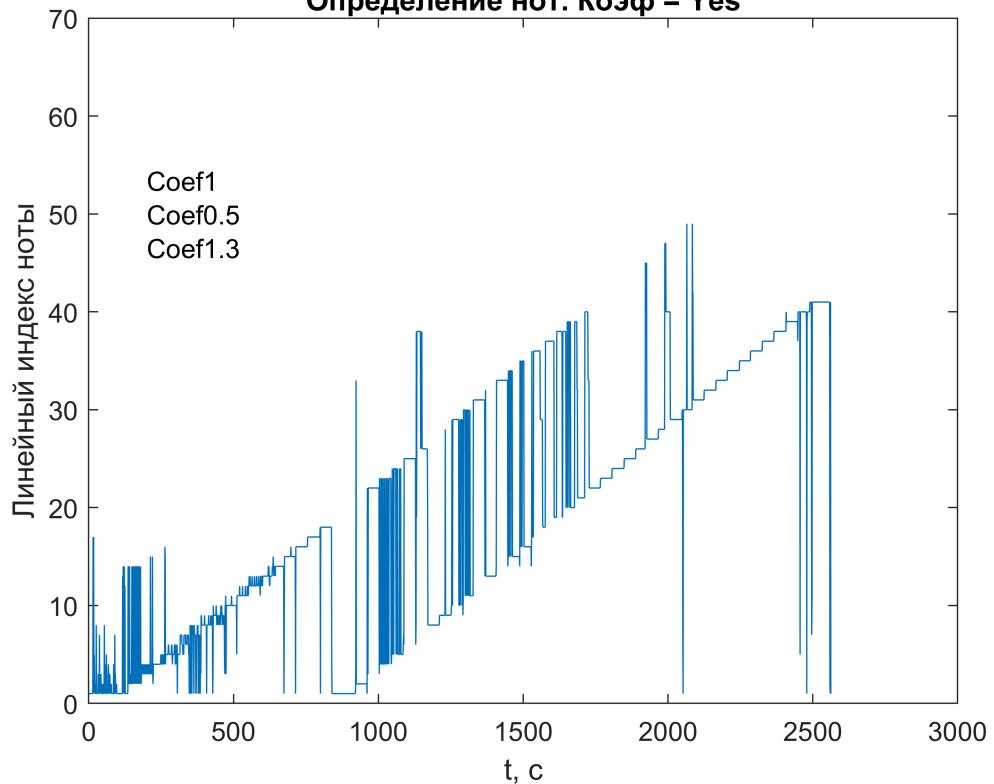
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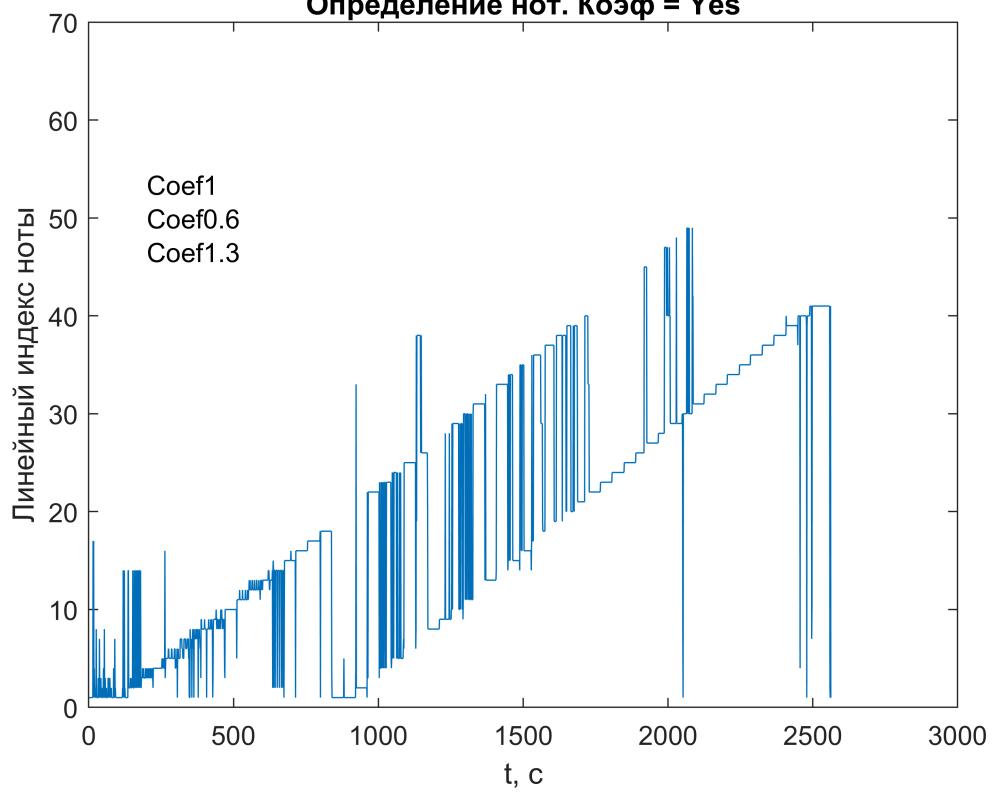
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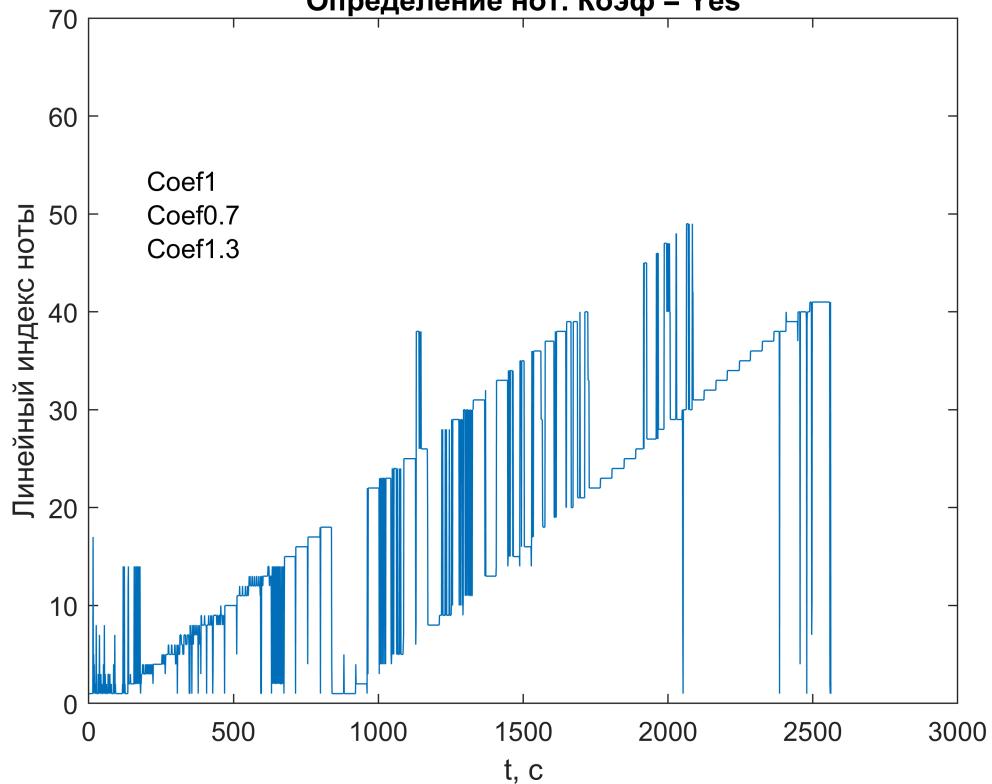
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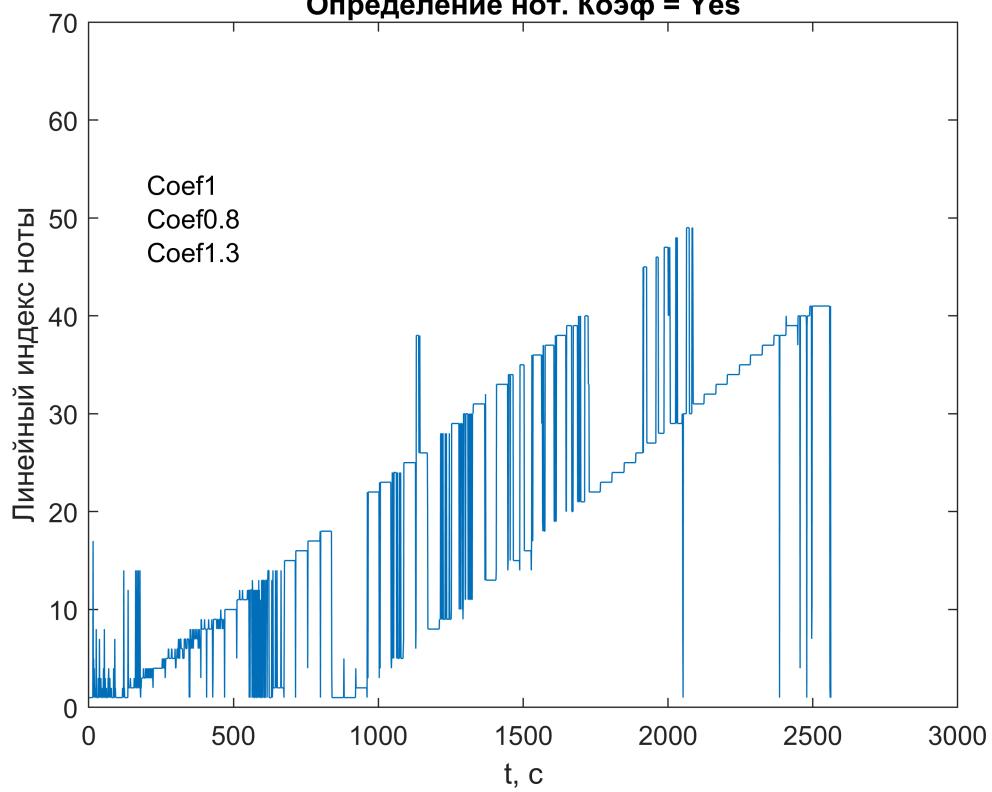
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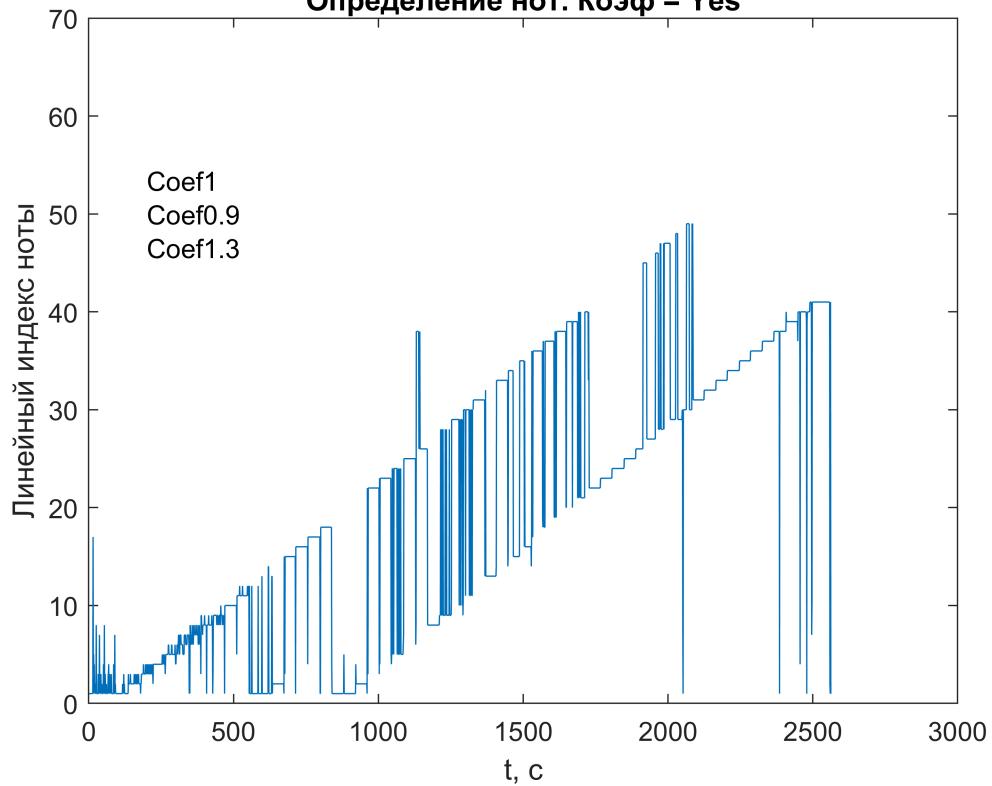
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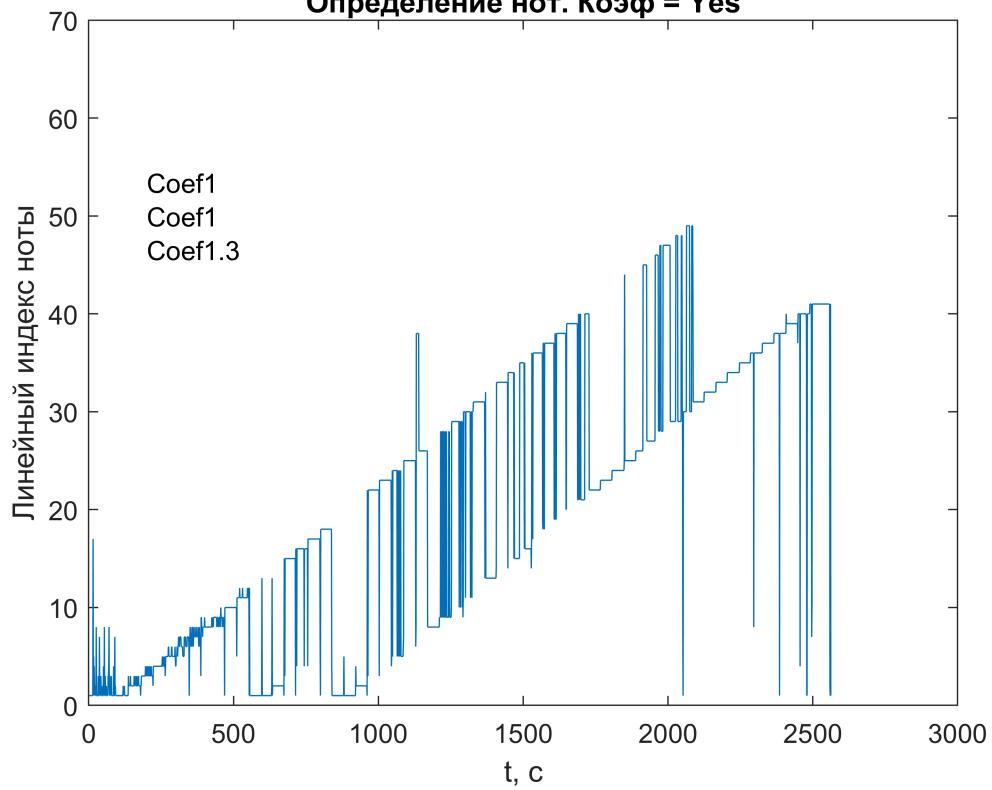
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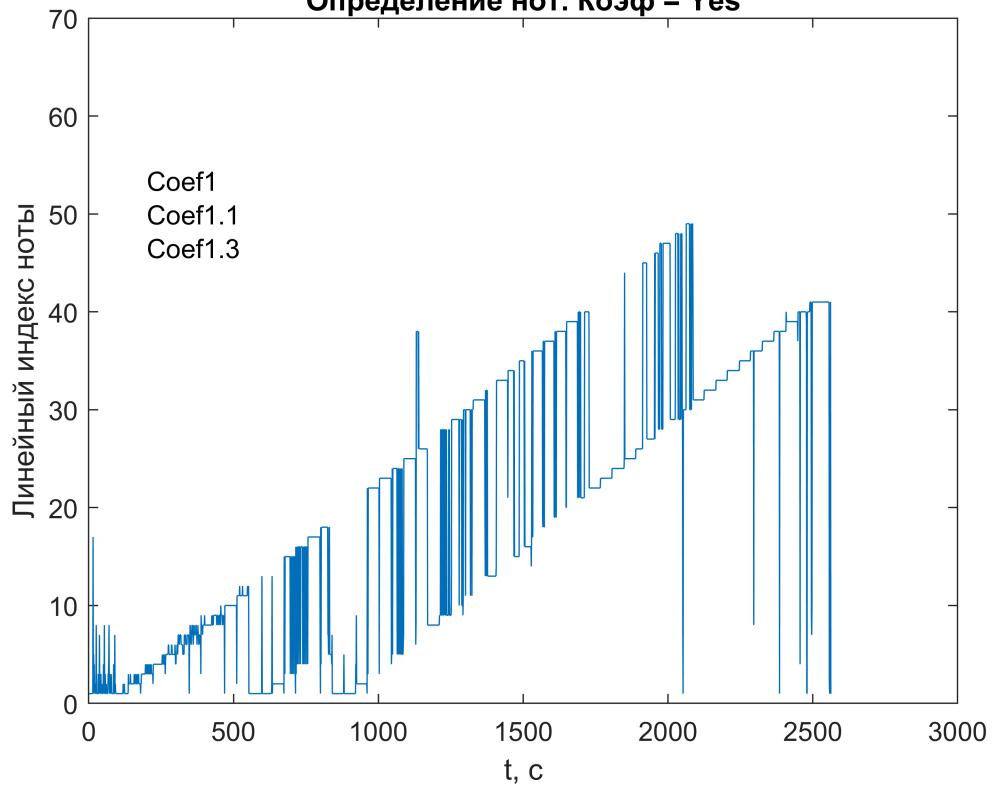
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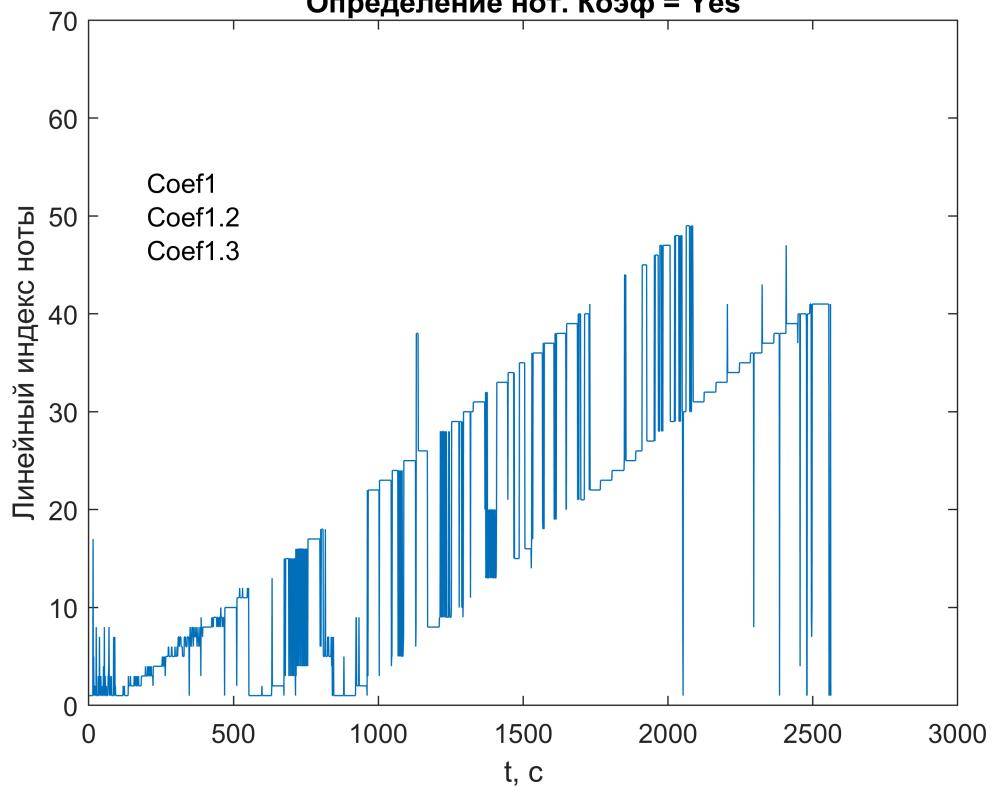
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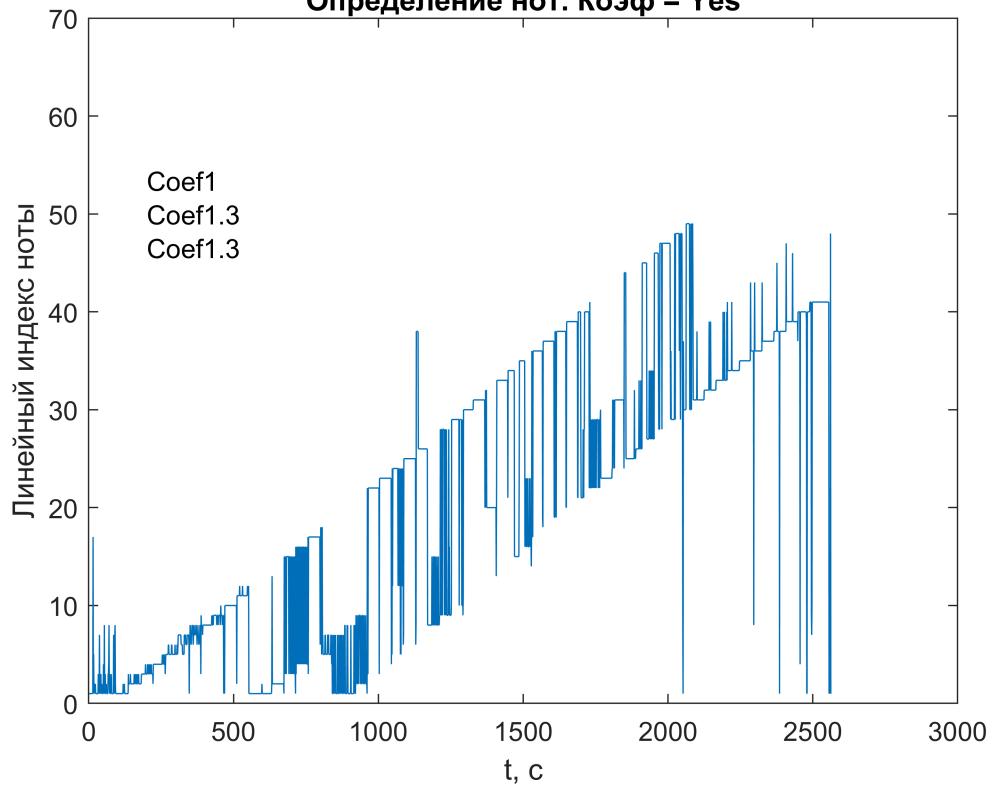
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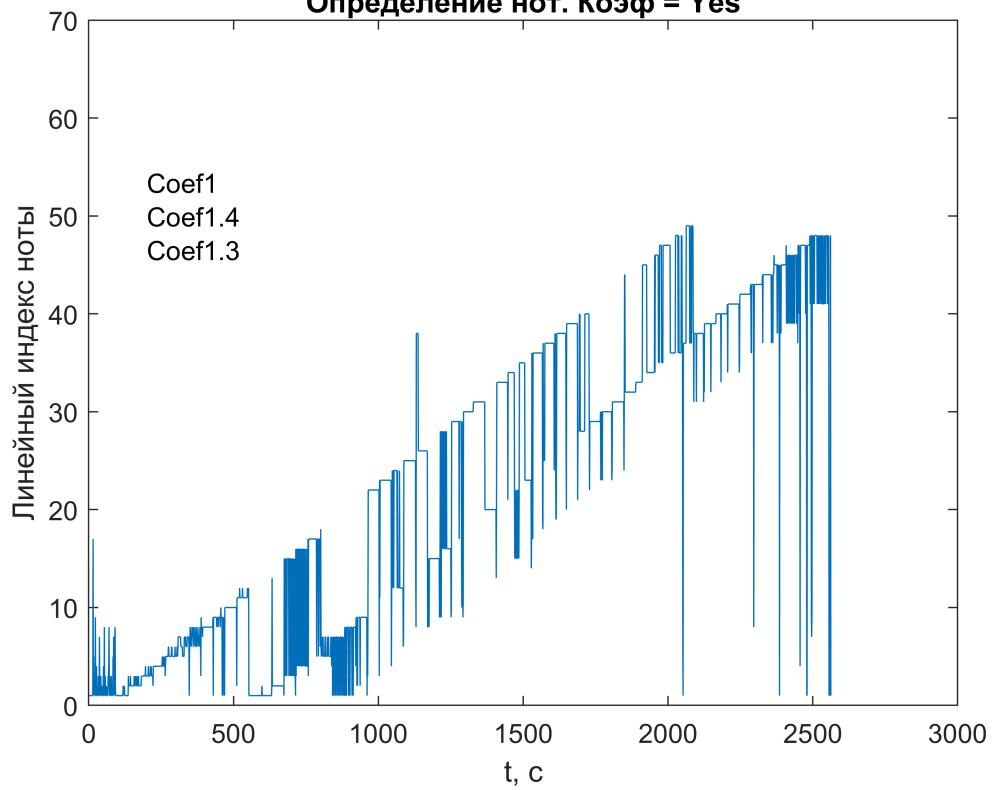
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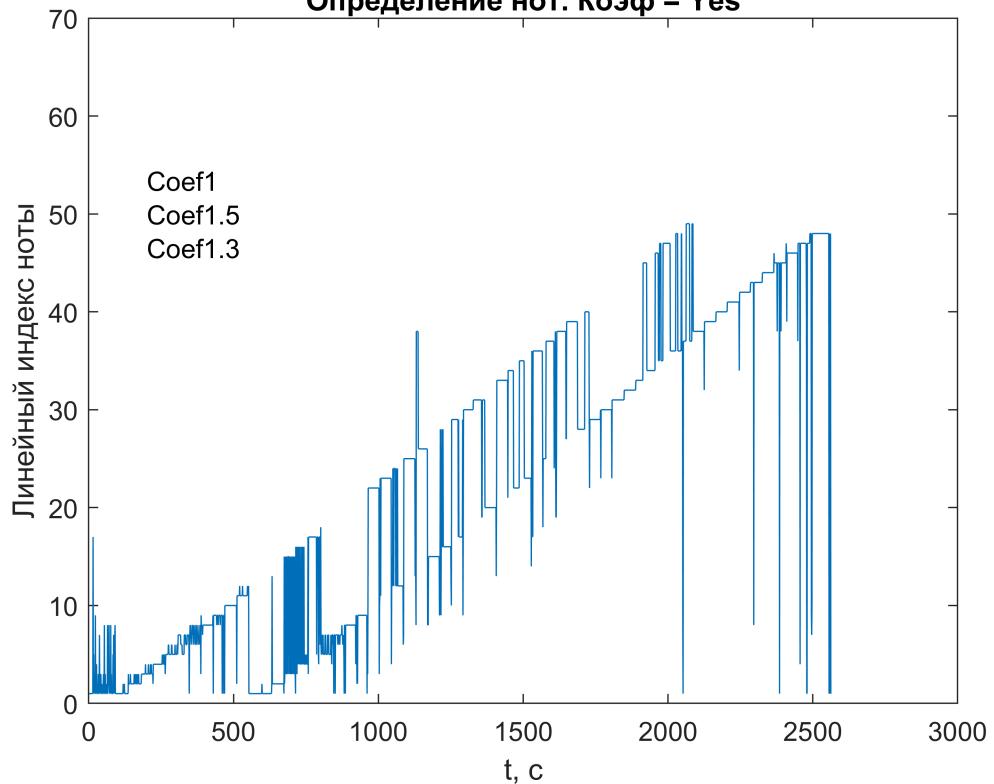
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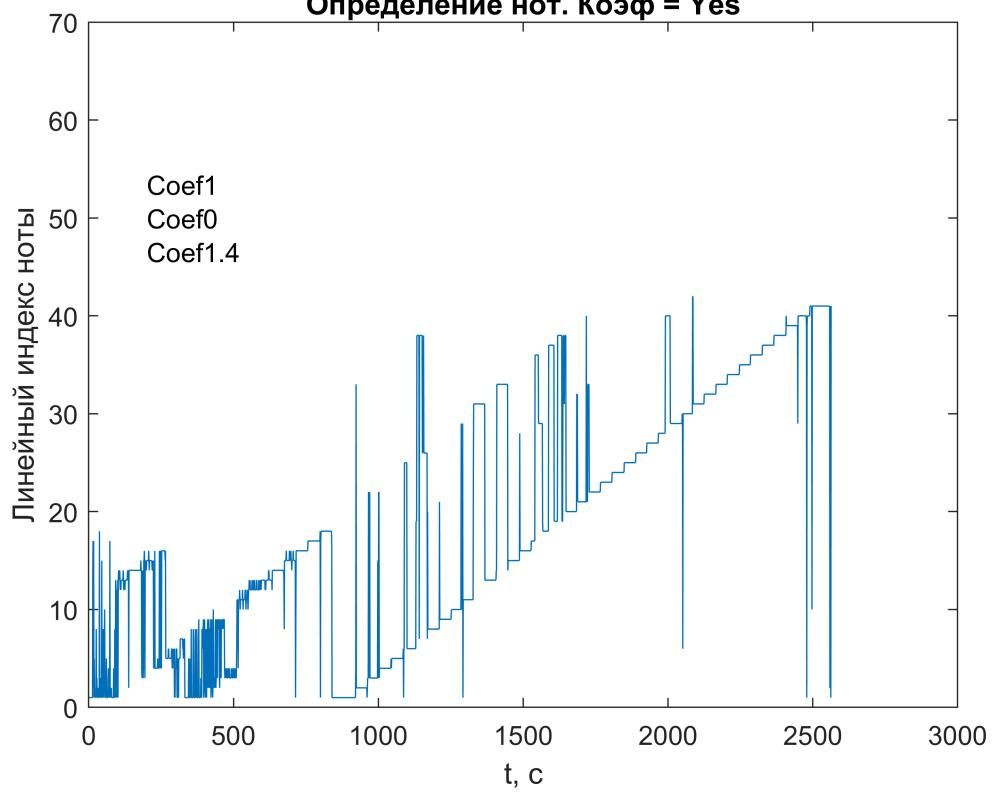
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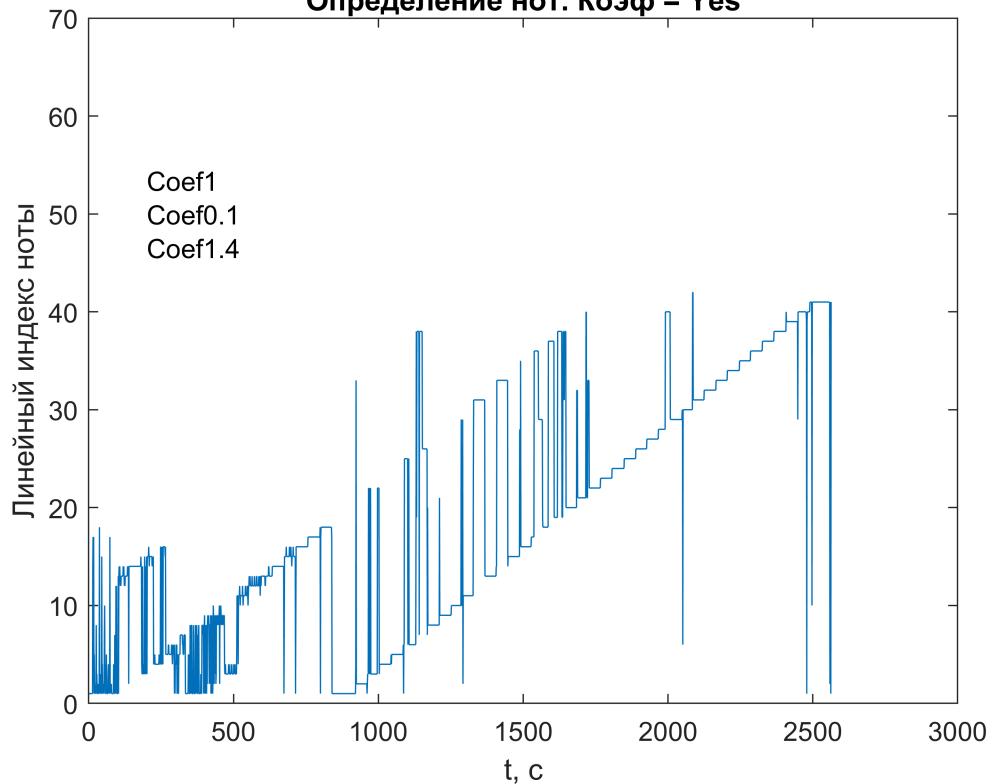
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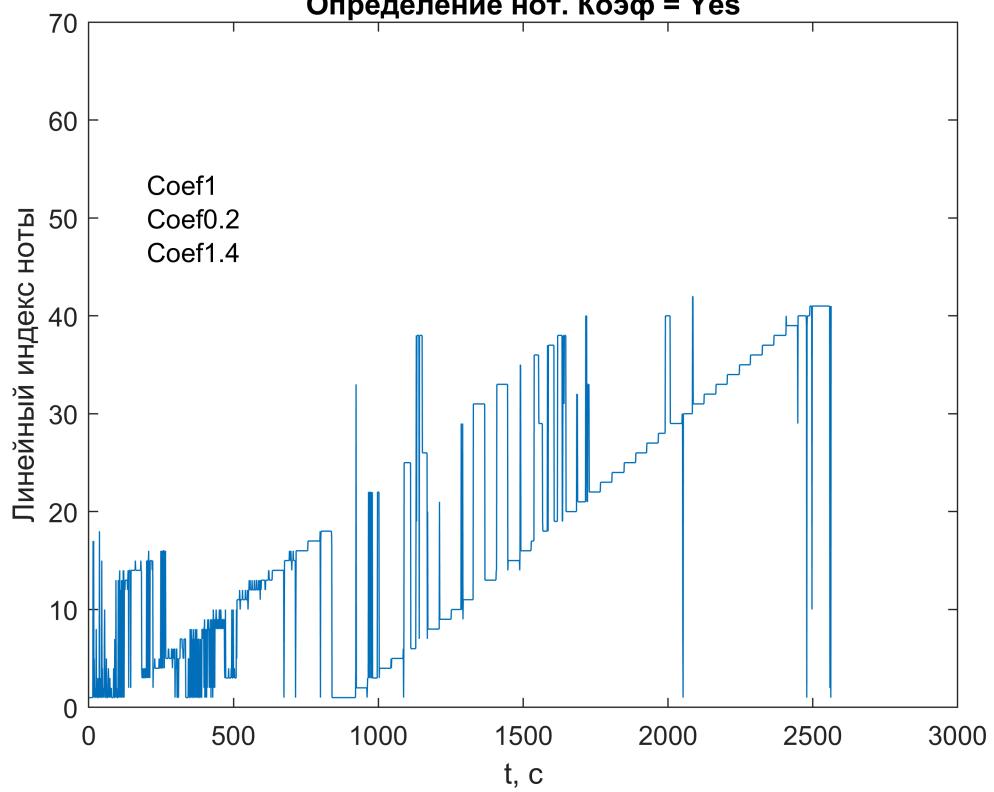
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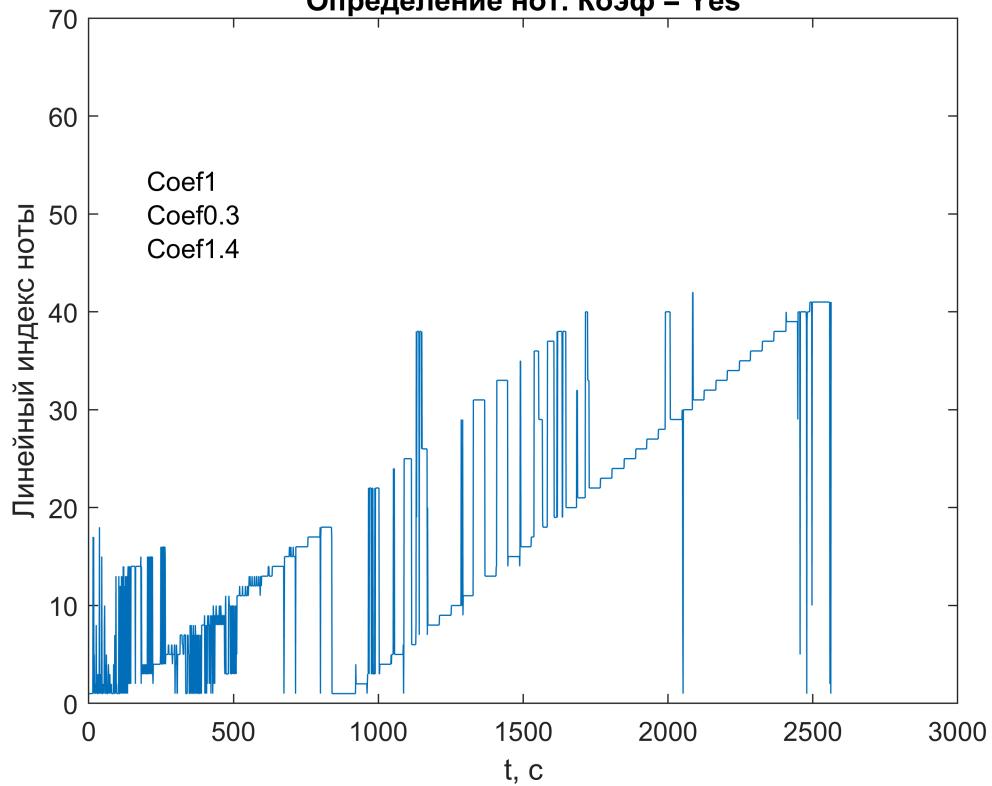
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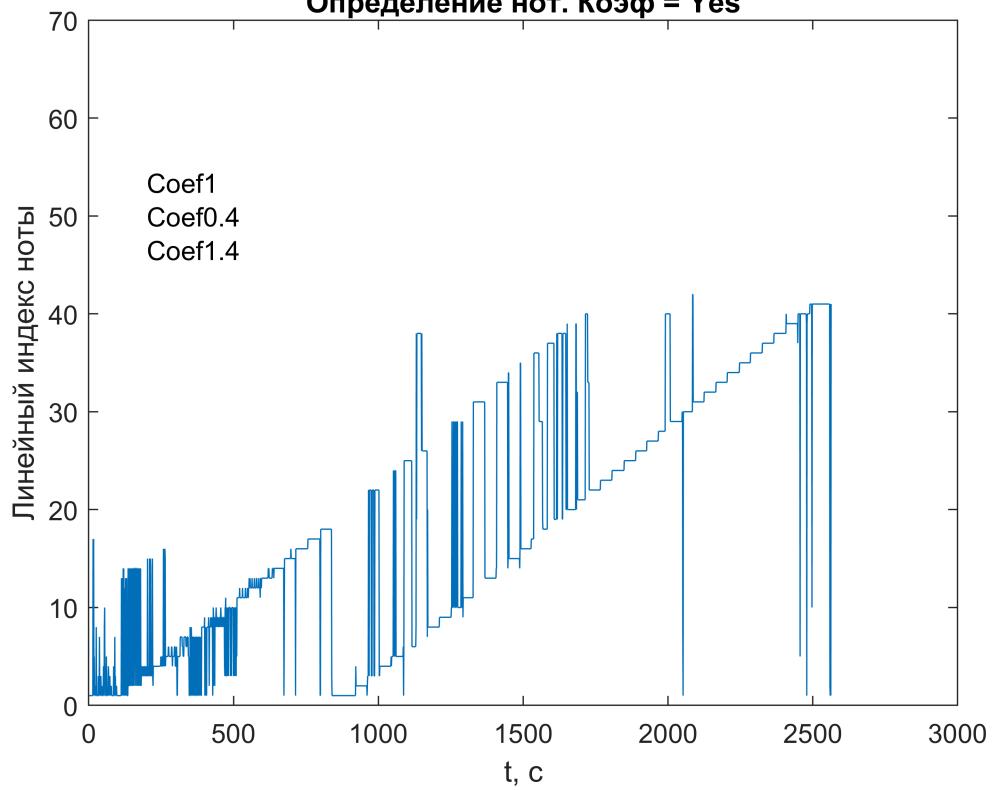
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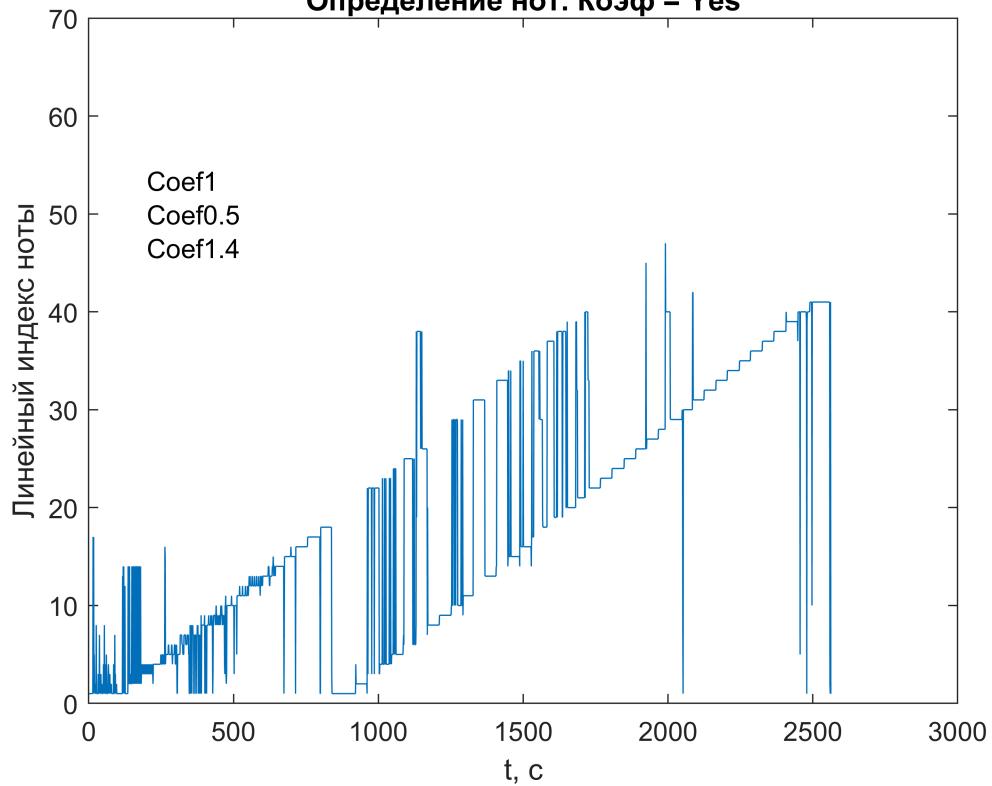
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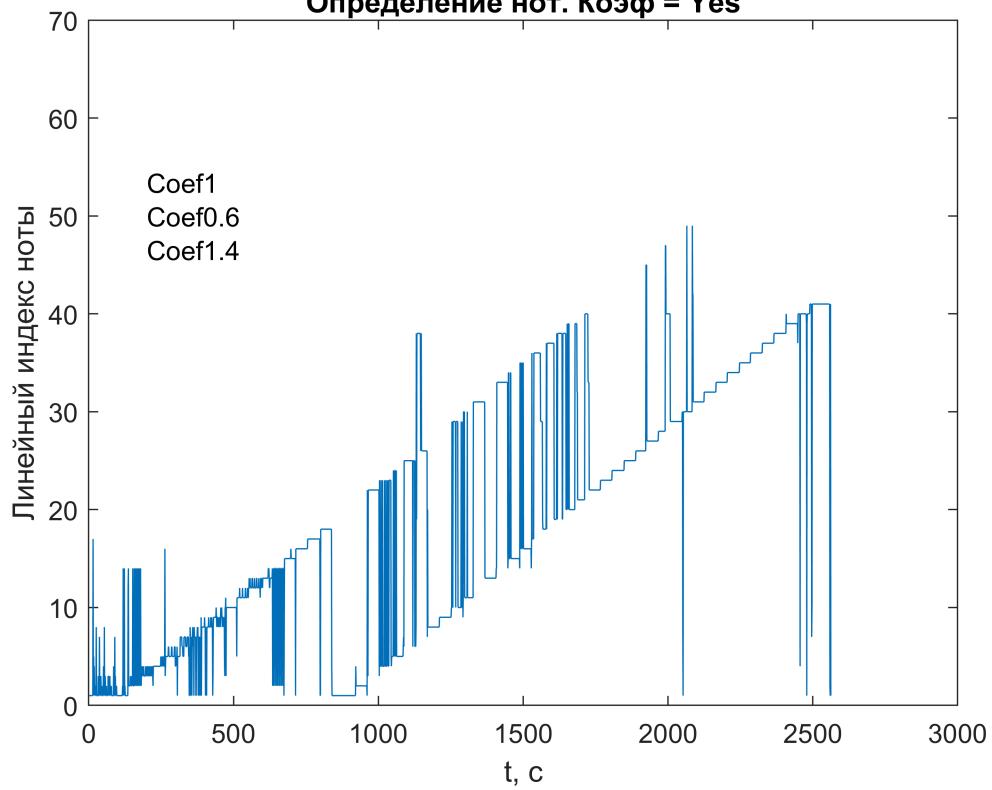
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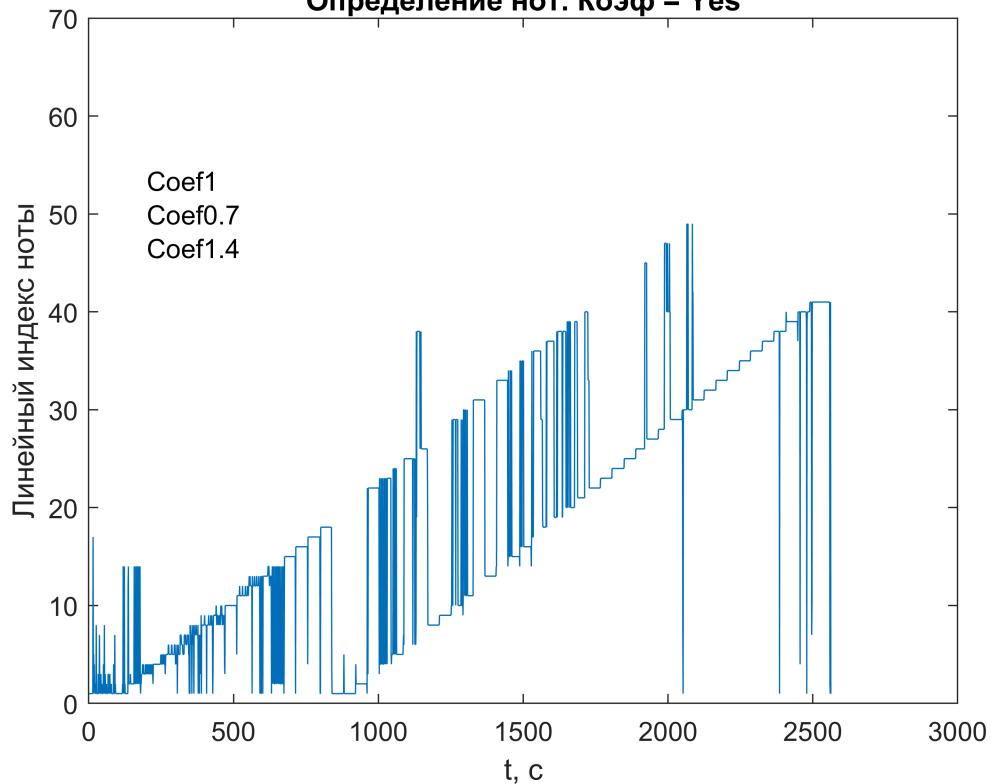
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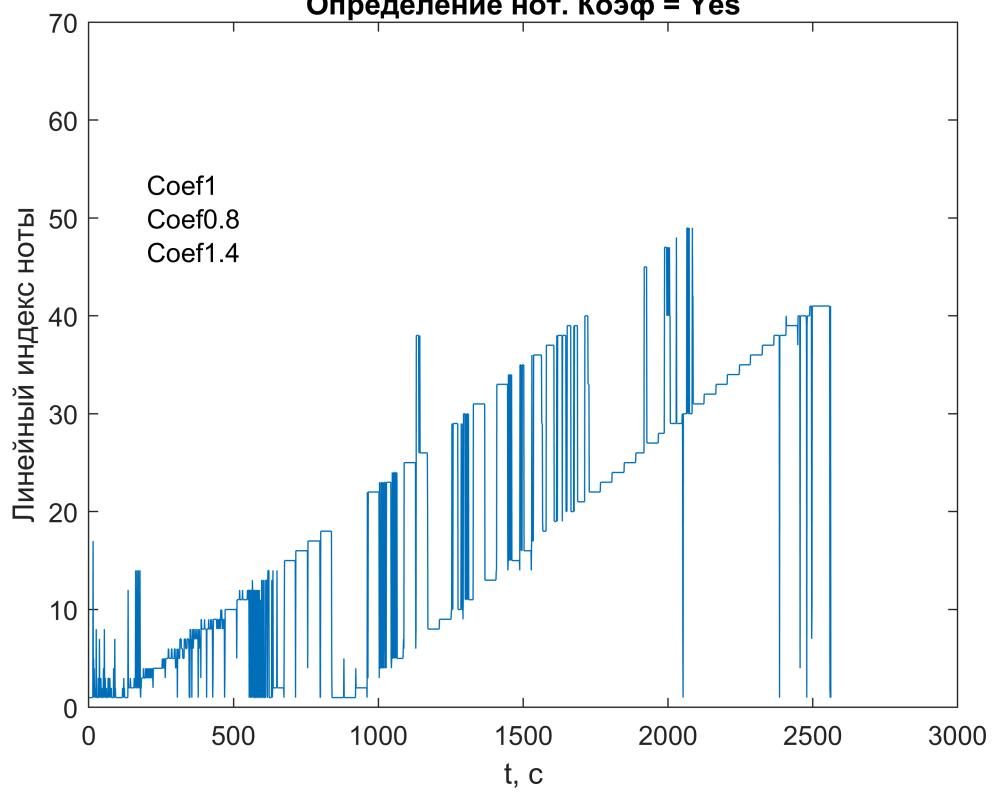
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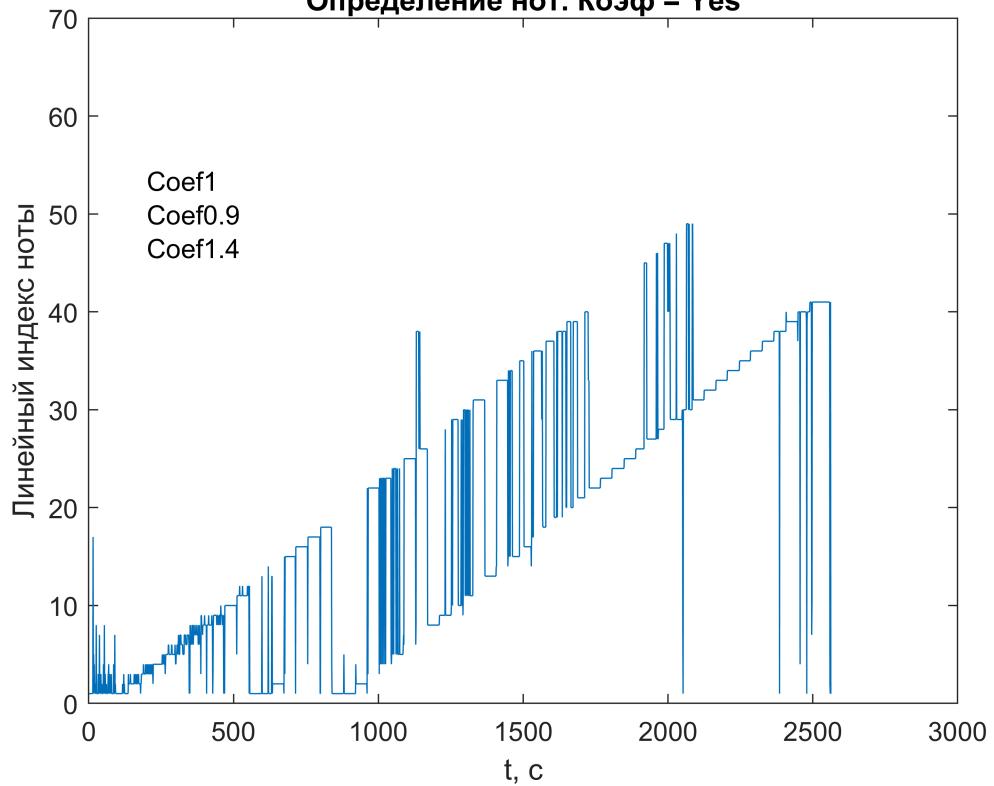
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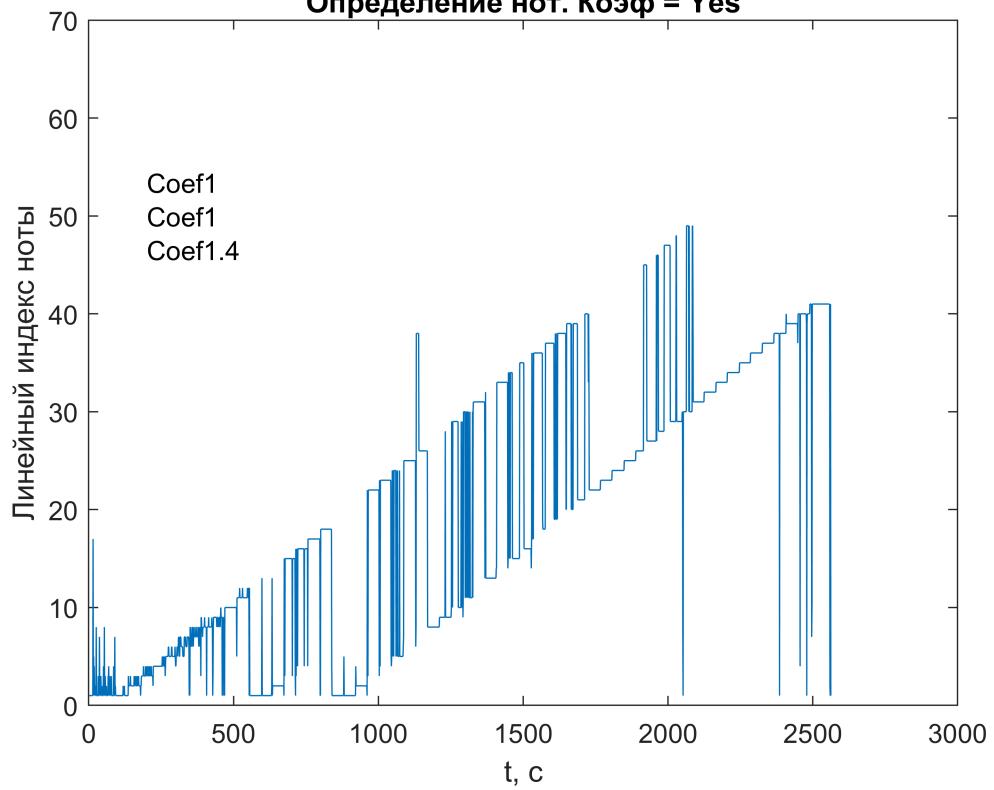
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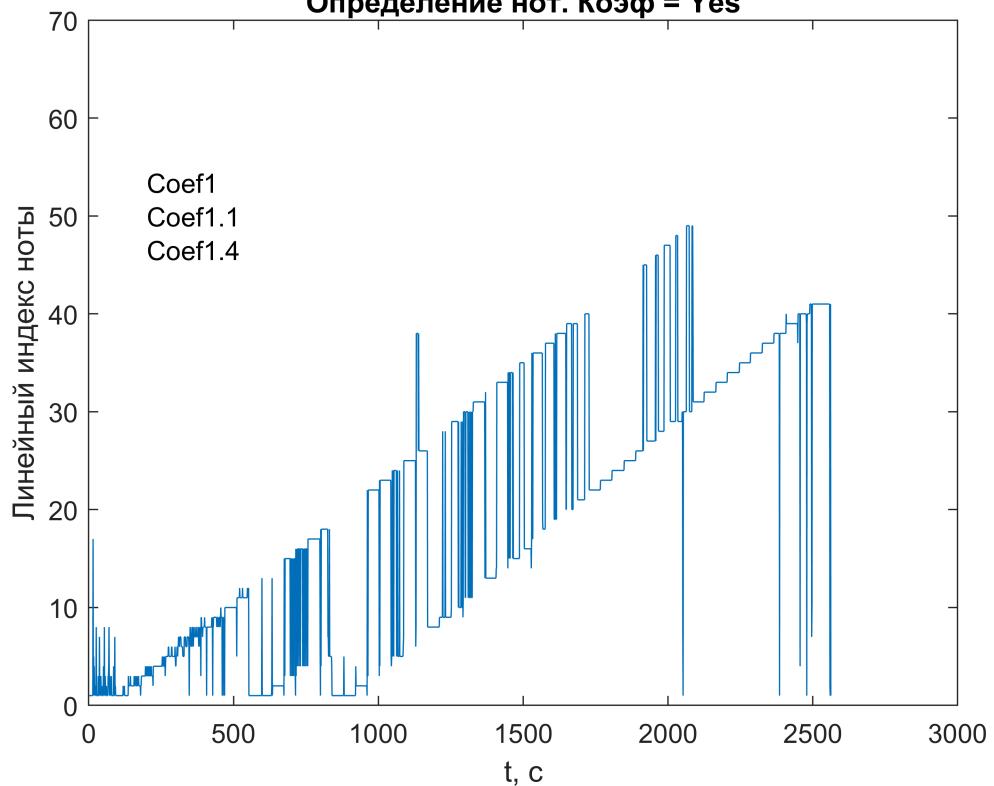
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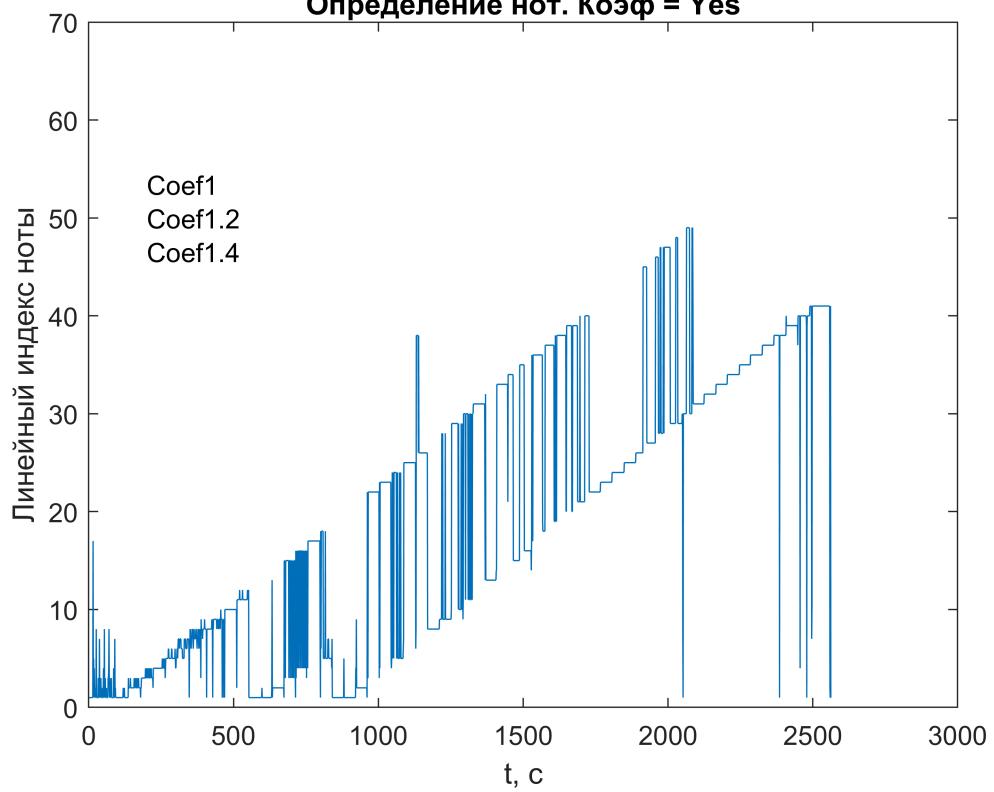
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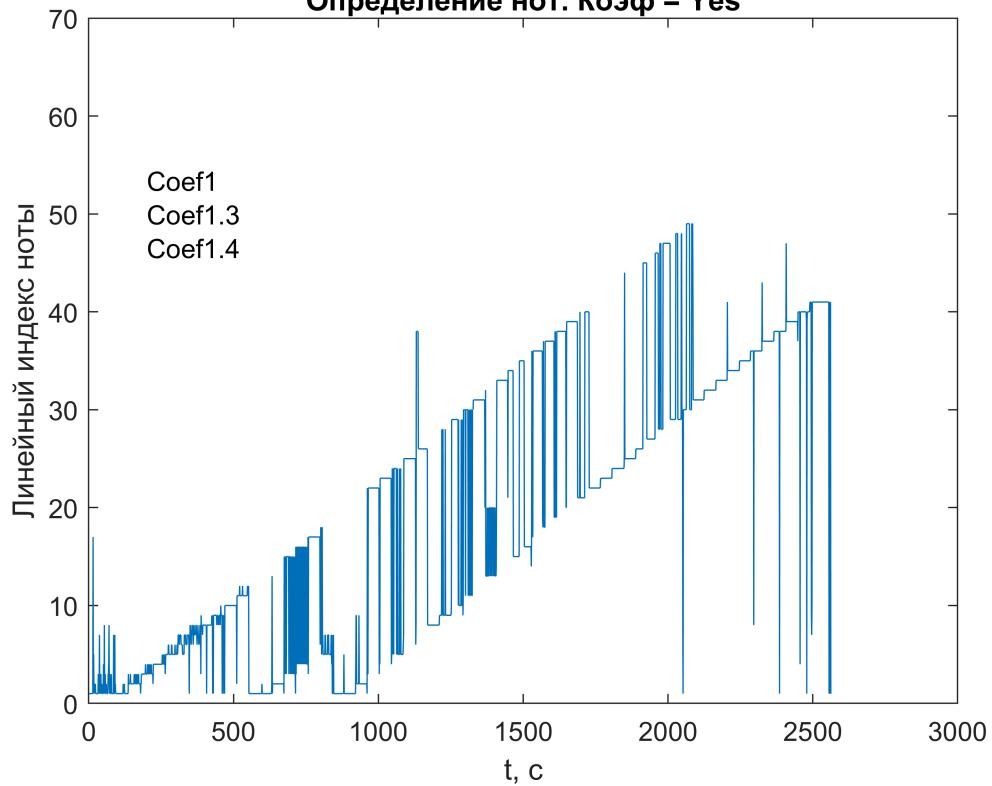
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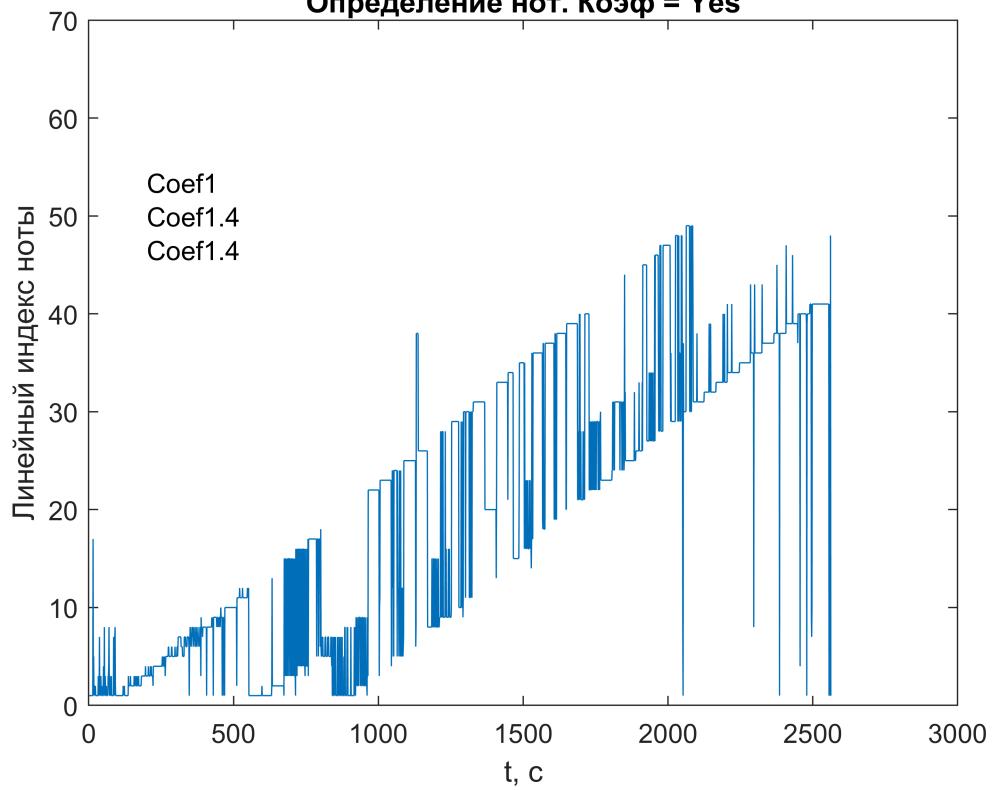
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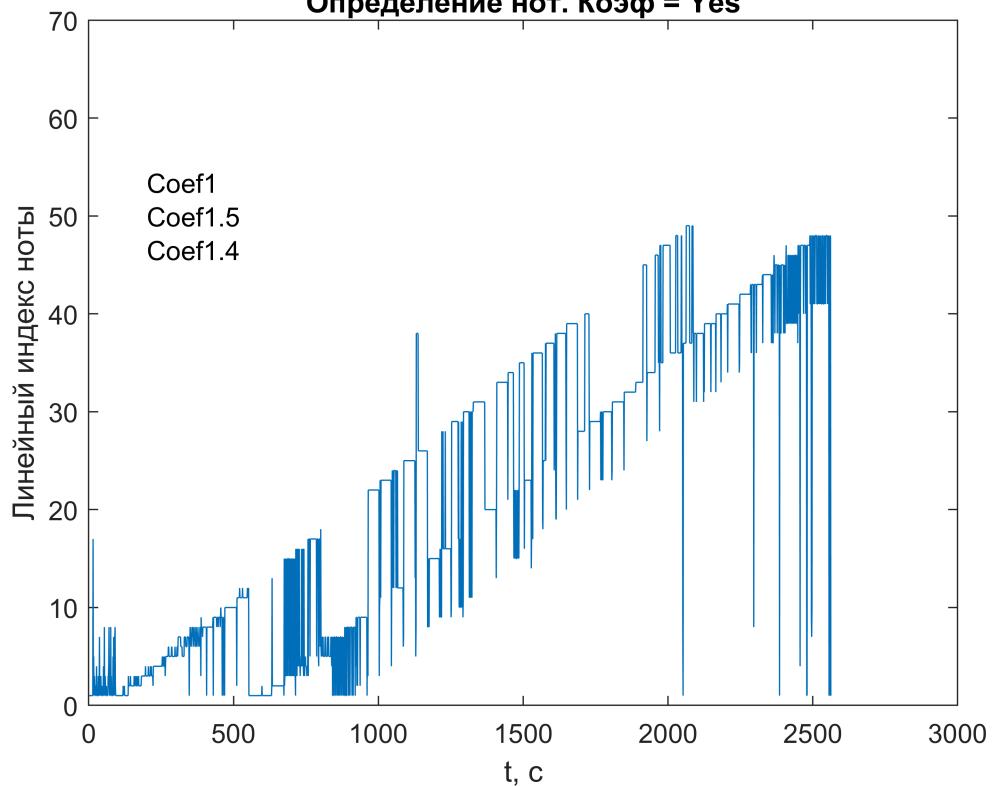
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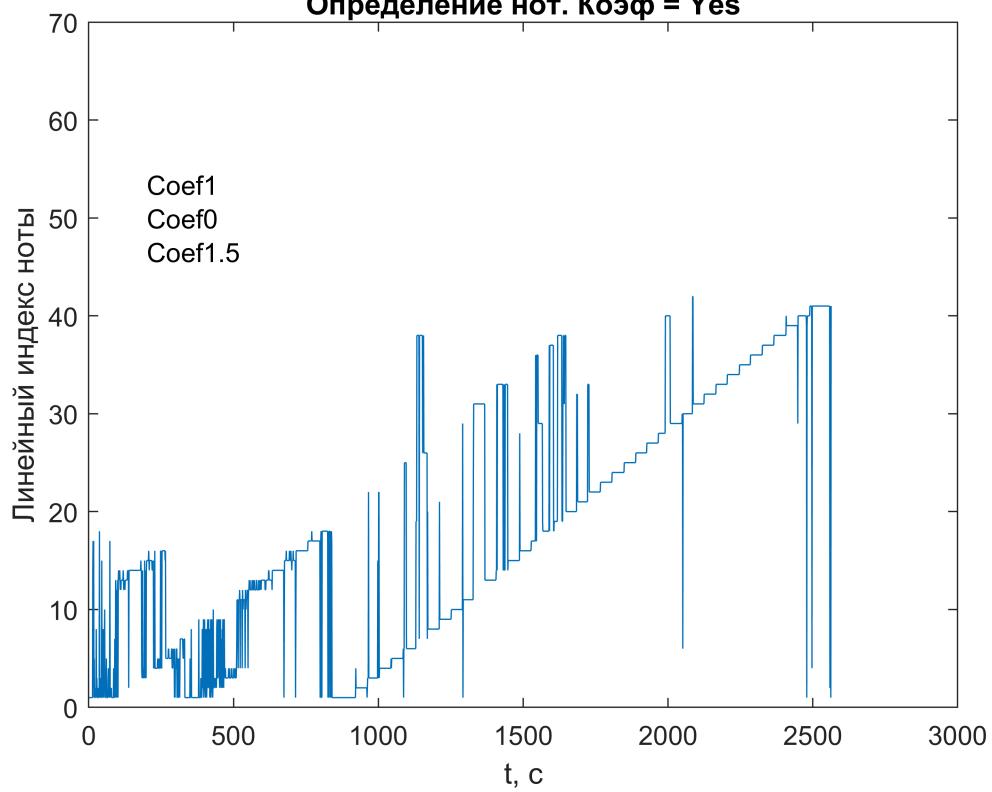
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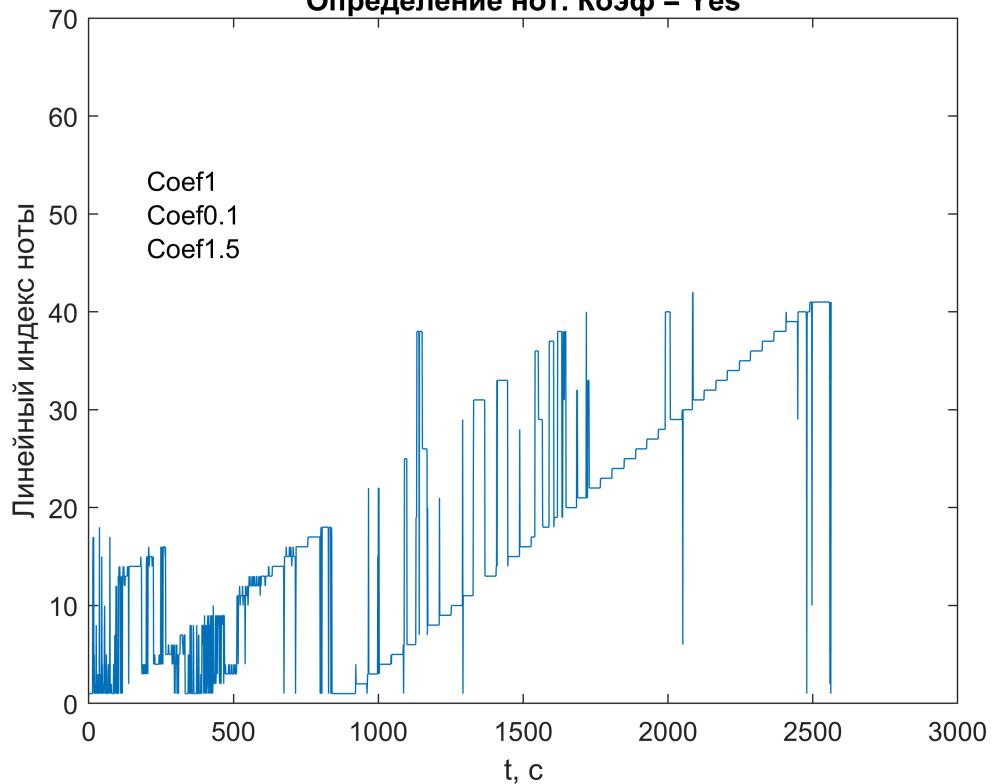
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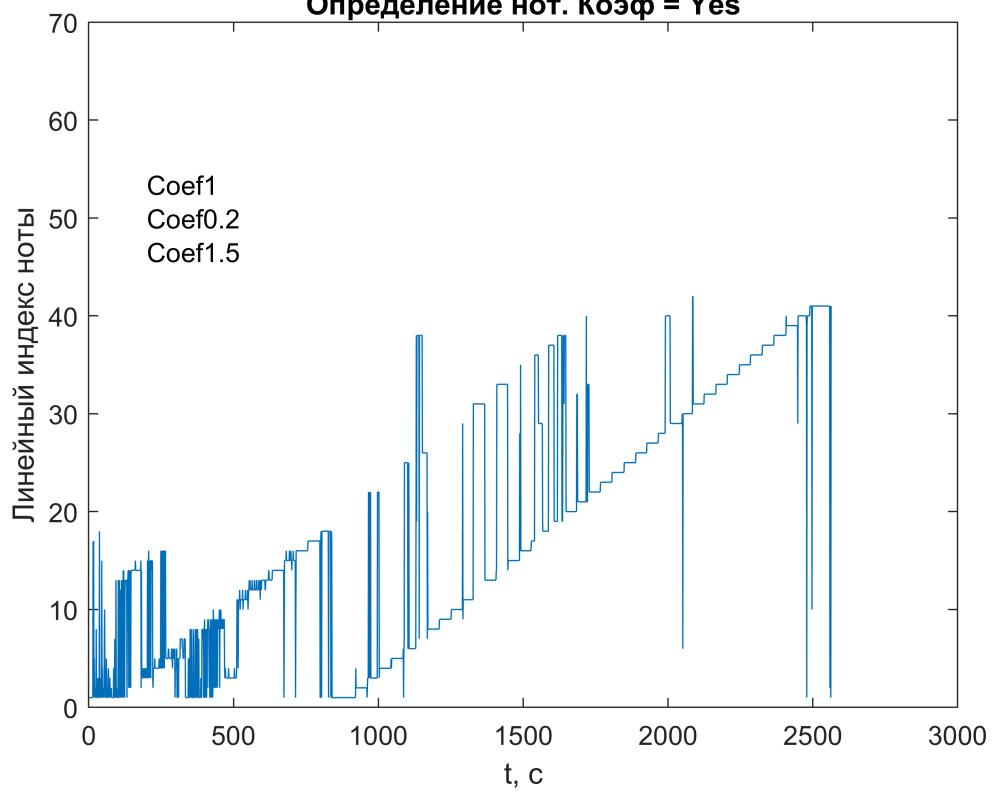
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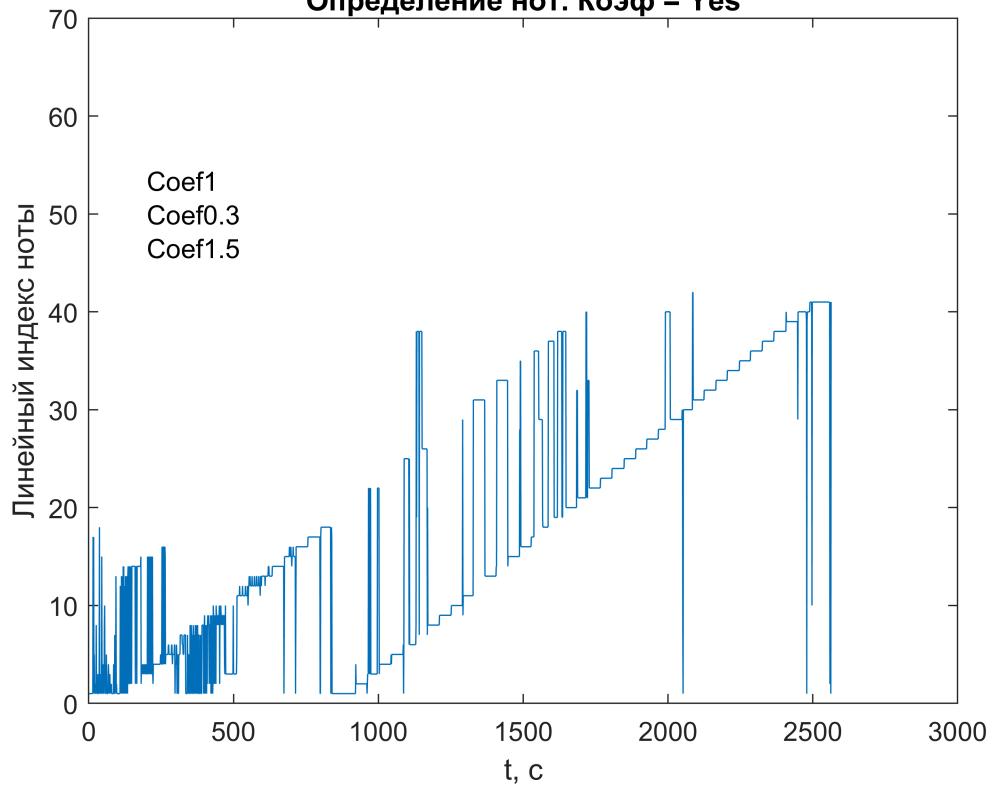
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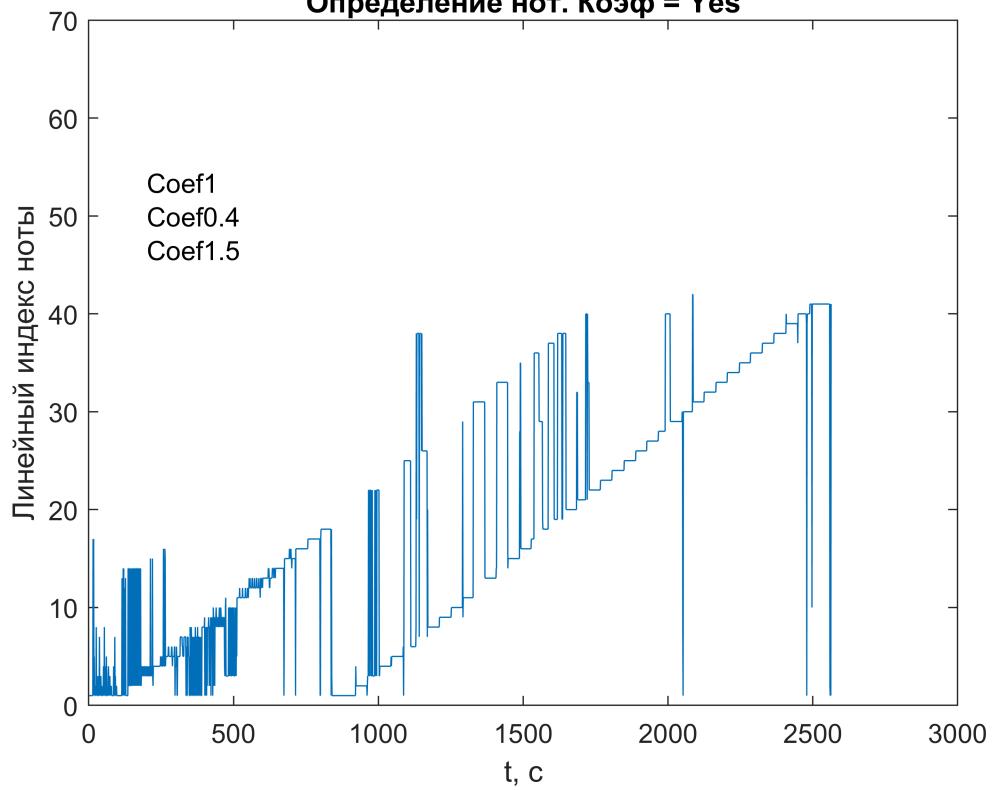
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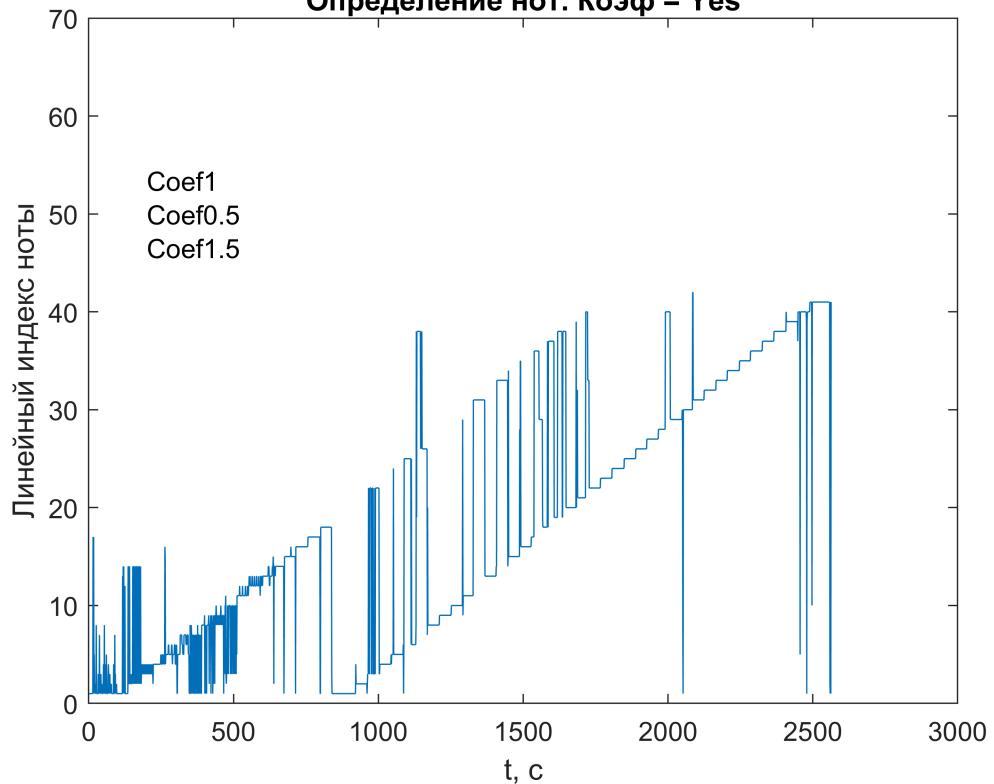
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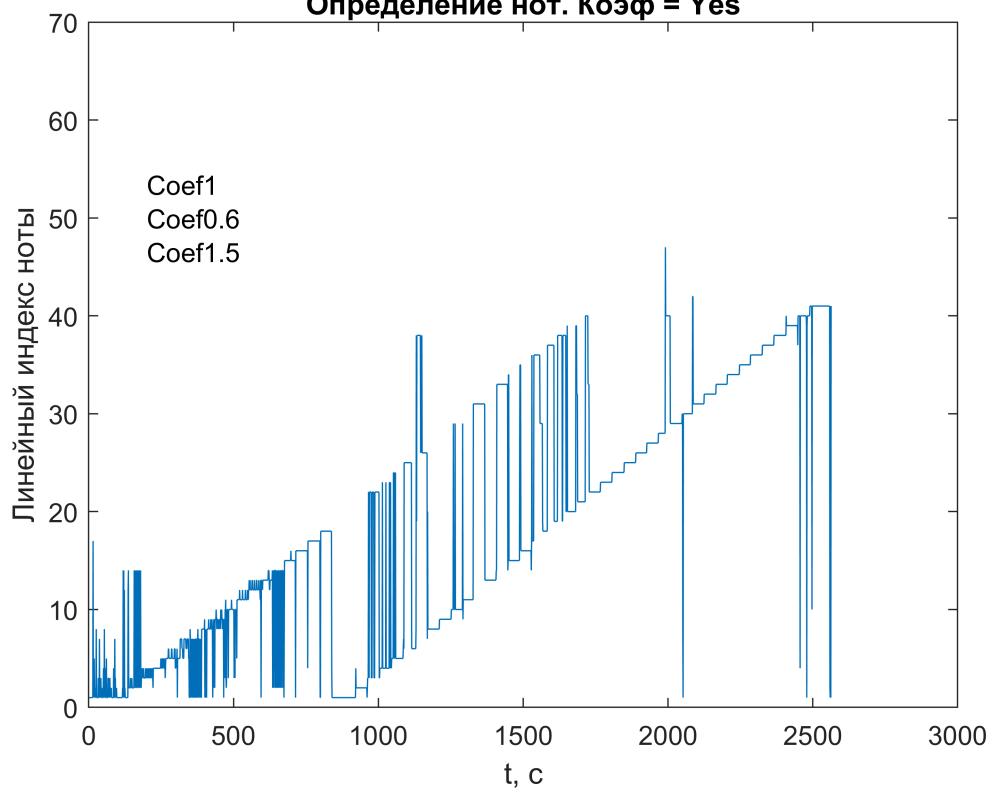
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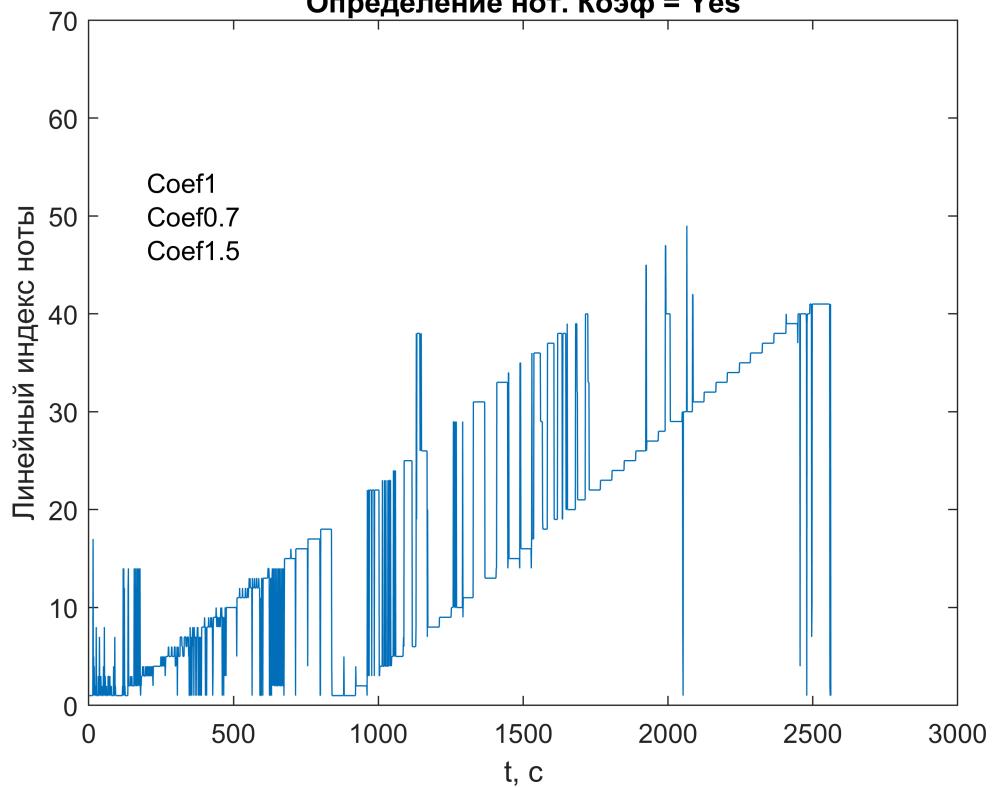
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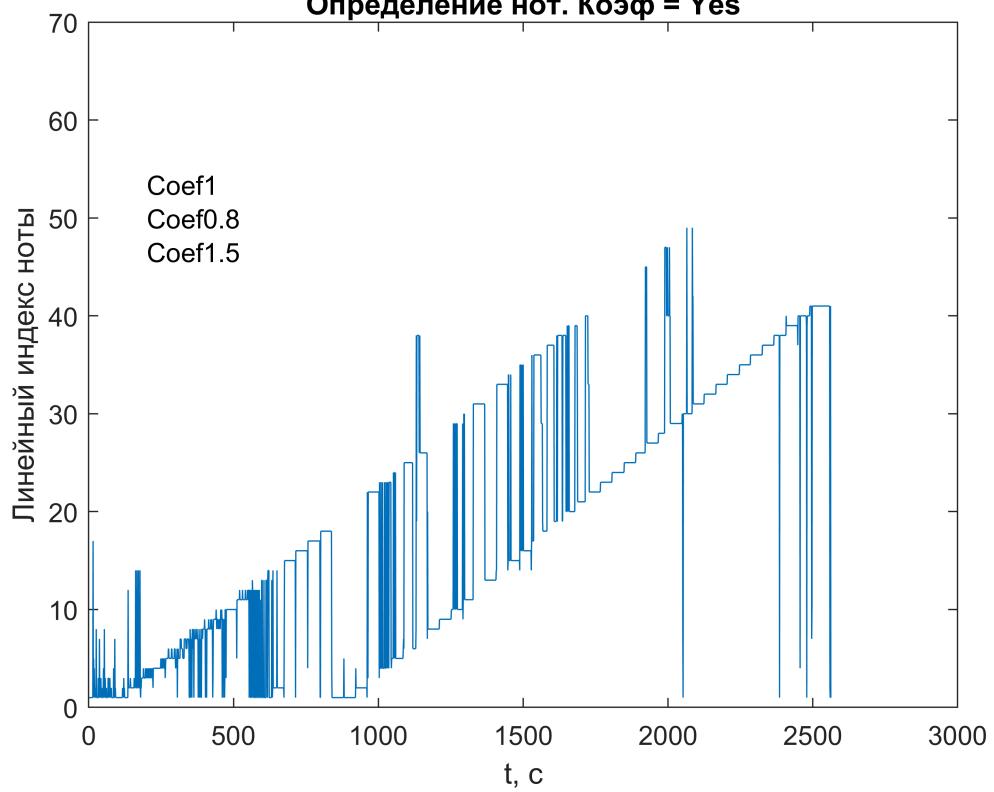
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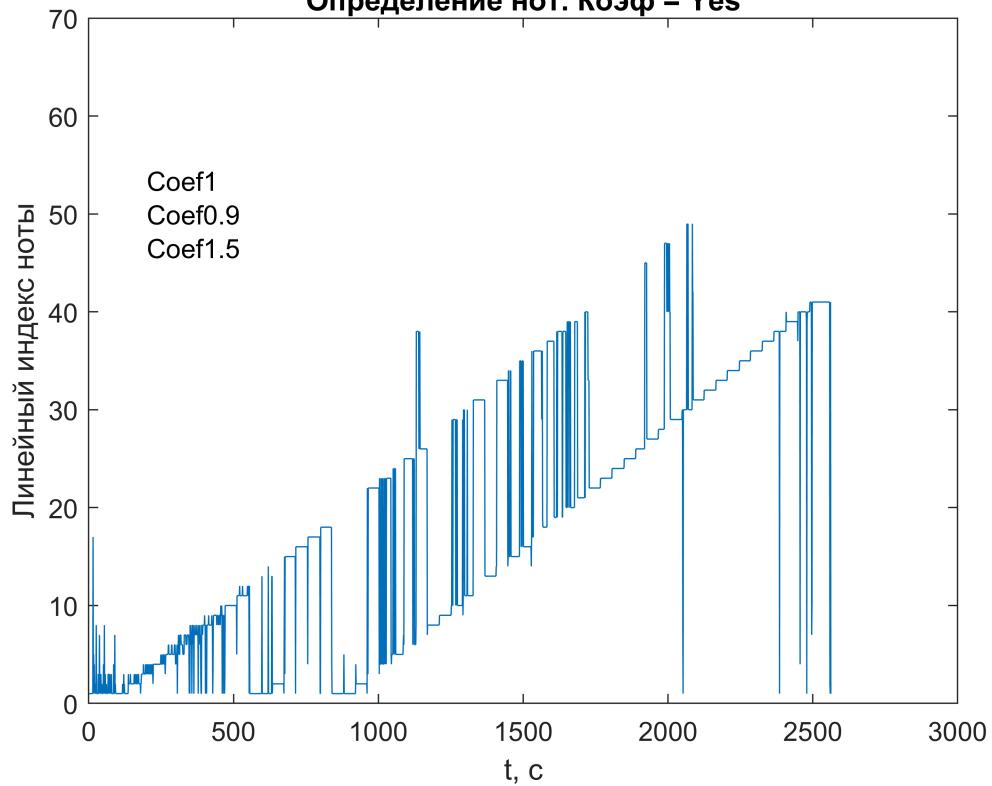
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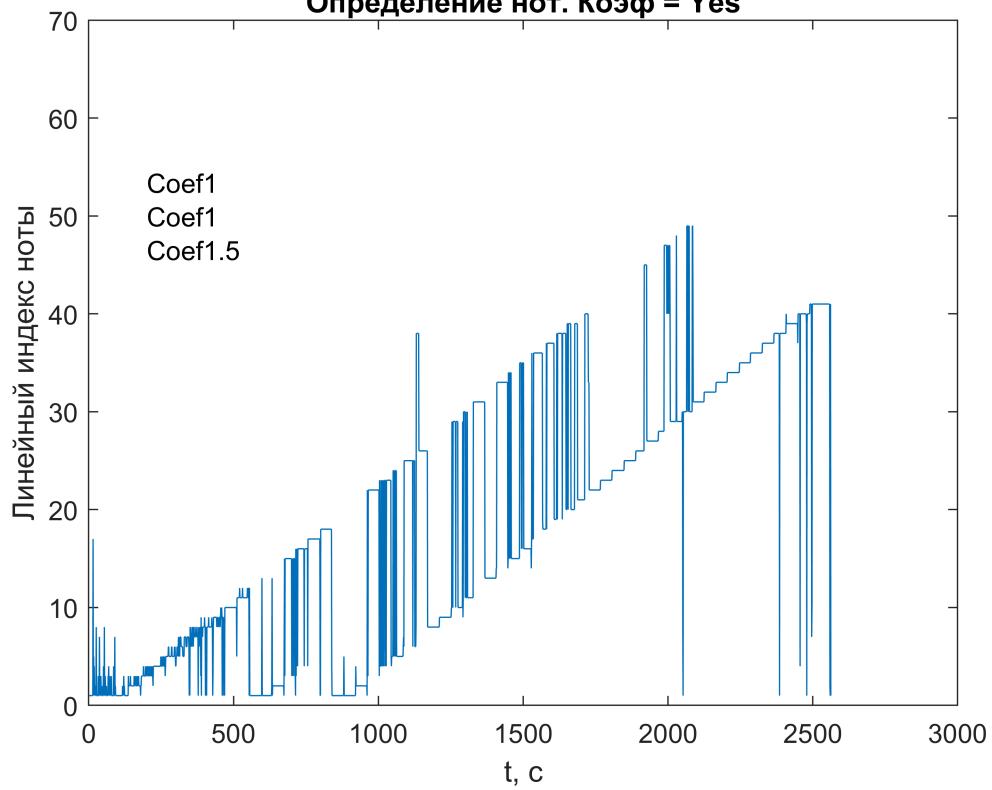
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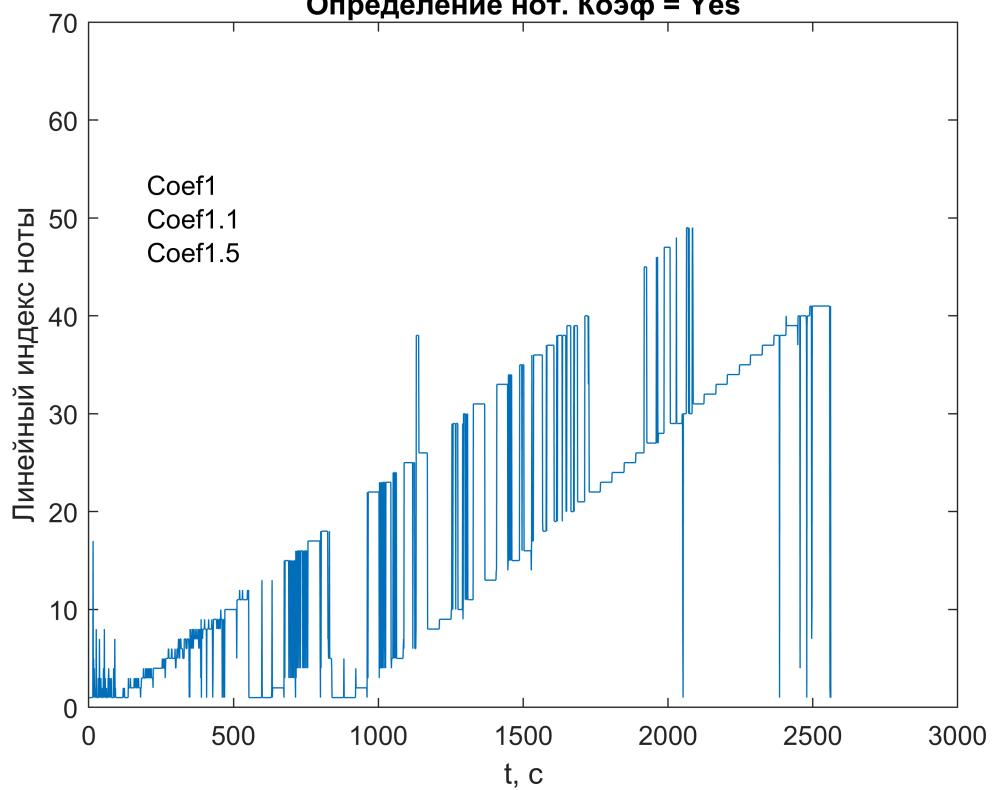
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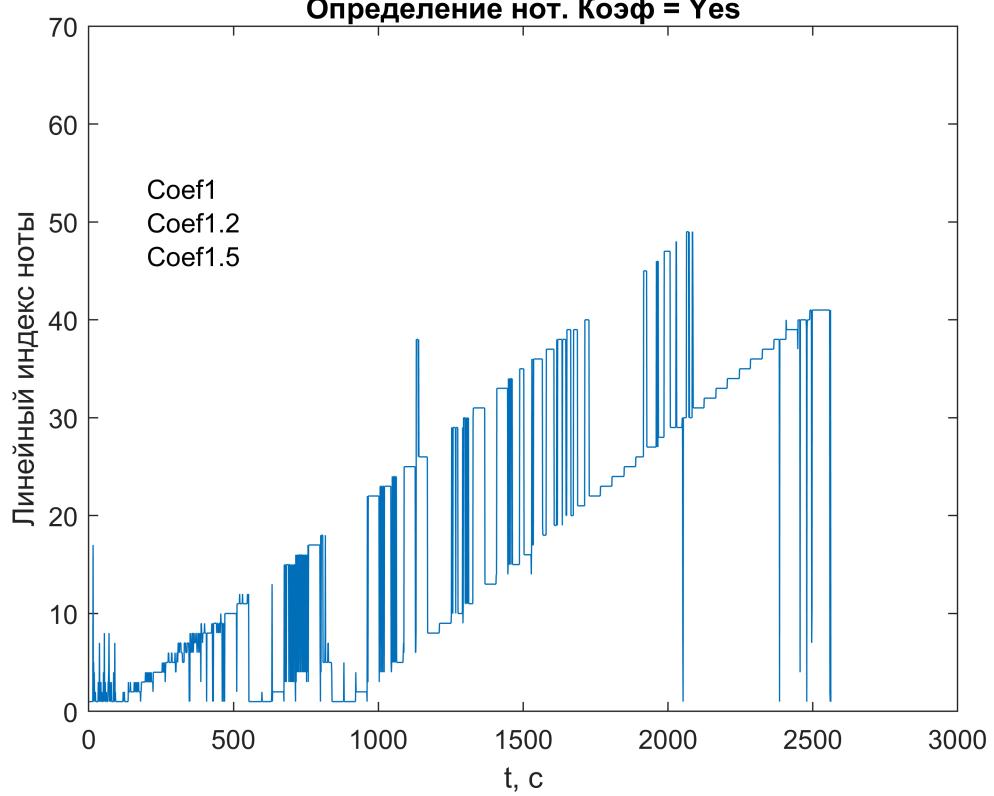
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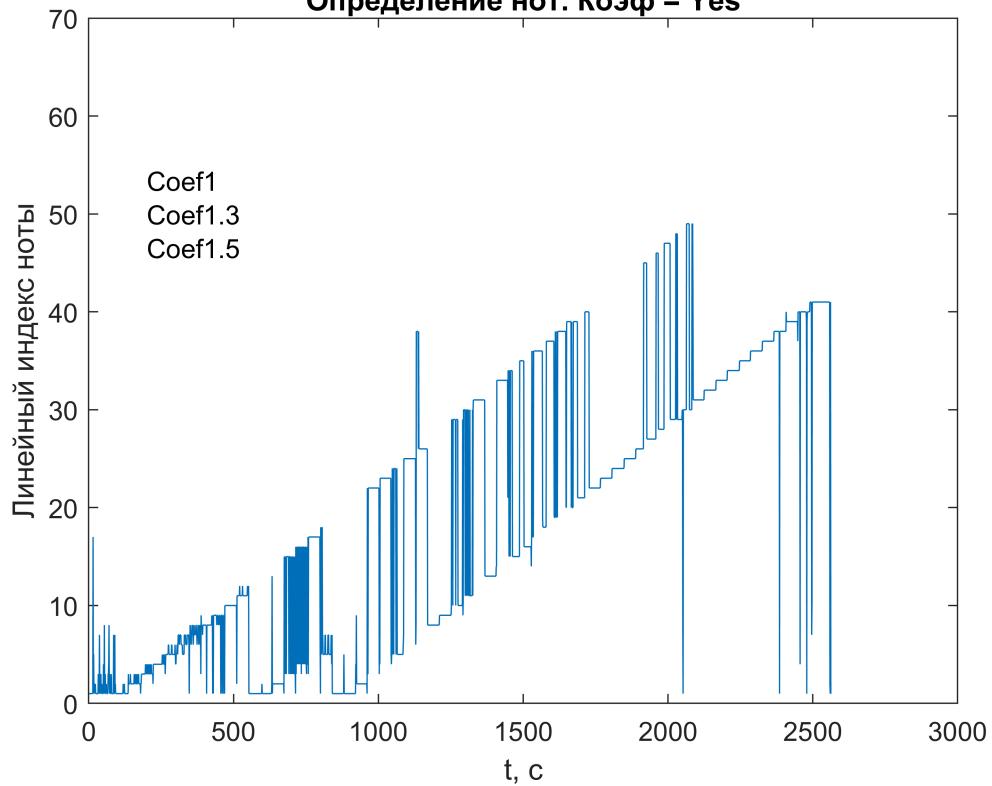
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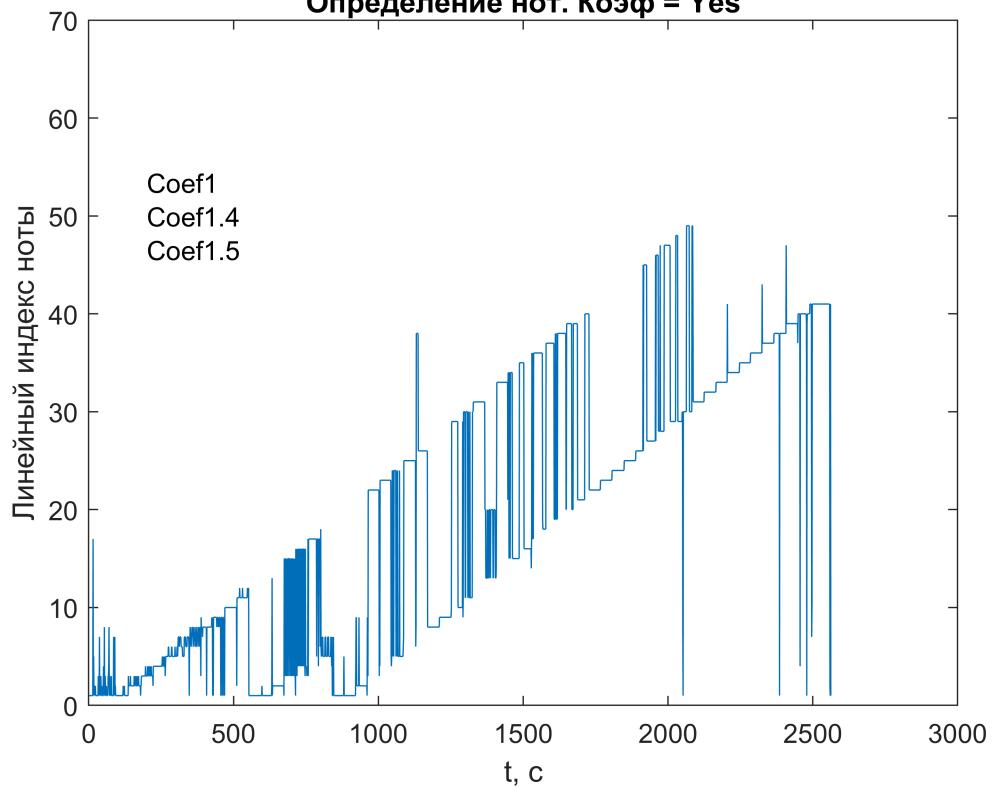
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**Определение нот. Коэф = Yes**



**Определение нот. Коэф = Yes**



### Определение нот. Коэф = Yes

