TRANZISTOR BIPOLAR. PSF. CONEXIUNE BAZA COMUNA

Proiect Grafica Asistata

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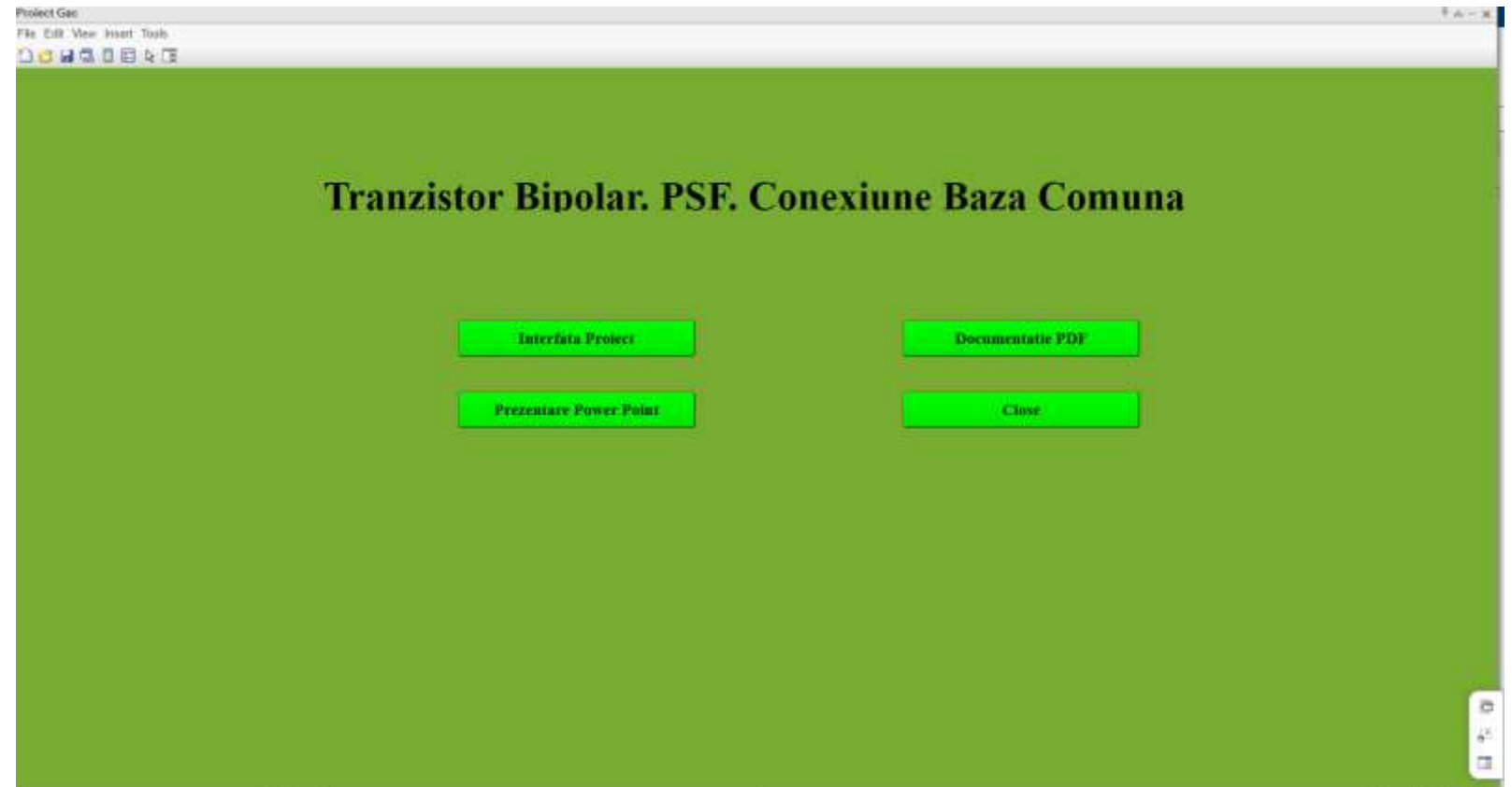Grupa 2125

CODUL PENTRU MENIUL PRINCIPAL

```matlab
1   clear all;
2   close all;
3
4
5
6   Fig=figure('Name','Proiect Gac',...
7       'Units','normalized',...
8       'Position',[0.1 0.2 0.9 0.7],...
9       'NumberTitle','off',...
10      'color', [0.4660 0.6740 0.1880]);
11
12  B_titlu=uicontrol('Style','text',...
13          'Units','normalized',...
14          'Position',[0.2 0.8 0.6 0.05],...
15          'Fontname', 'Times New Roman',...
16          'Fontsize', 40,...
17          'BackgroundColor', [0.4660 0.6740 0.1880],...
18          'FontWeight','bold',...
19          'String','Tranzistor Bipolar. PSF. Conexiune Baza Comuna');
20
21  B_proiect=uicontrol('Style','pushbutton',...
22          'Units','normalized',...
23          'Position',[0.3 0.6 0.16 0.05],...
24          'Fontname', 'Times New Roman',...
25          'Fontsize', 16,...
26          'backgroundcolor', 'green',...
27          'FontWeight','bold',...|
28          'String','Interfata Proiect',...
29          'Callback','startproiect');
30
31  B_prezentare=uicontrol('Style','pushbutton',...
32          'Units','normalized',...
33          'Position',[0.3 0.5 0.16 0.05],...
34          'Fontname', 'Times New Roman',...
35          'Fontsize', 16,...
36          'backgroundcolor', 'green',...
37          'FontWeight','bold',...
38          'String','Prezentare Power Point',...
39          'Callback','open(''PREZENTARE_PR_GAC.pdf'')');
40
41

42
43  B_documentatie=uicontrol('Style','pushbutton',...
44          'Units','normalized',...
45          'Position',[0.6 0.6 0.16 0.05],...
46          'Fontname', 'Times New Roman',...
47          'Fontsize', 16,...
48          'backgroundcolor', 'green',...
49          'FontWeight','bold',...
50          'String','Documentatie PDF',...
51          'Callback','open(''DOCUMENTATIE_PR_GAC.pdf'')');
52
53
54  B_inchidere=uicontrol('Style','pushbutton',...
55          'Units','normalized',...
56          'Position',[0.6 0.5 0.16 0.05],...
57          'Fontname', 'Times New Roman',...
58          'Fontsize', 16,...
59          'backgroundcolor', 'green',...
60          'FontWeight','bold',...
61          'String','Close',...
62          'Callback','close');
63
64
```

MENIUL PRINCIPAL

CODUL PENTRU INTERFATA PROIECTULUI

```matlab
function tranzistor (A,f,N,RB1,RB2,RC,RE,beta,VA1)

Fig=figure( ...
    'Name','Proiect GAC',...
    'Units','normalized',...
    'Position',[0.1 0.1 0.85 0.8],...
    'NumberTitle','off',...
    'color',[0.4660 0.6740 0.1880]);

    VBE=0.7;
    VTh=(RB2./(RB1+RB2))*VA1;
    RTh=(RB1.*RB2)./(RB1+RB2);
    IC=beta*((VTh-VBE)/(RTh+(beta+1)*RE));
    VCE=VA1-IC*(RC+RE);

    Ro=RC;
    gm=40.*IC;
    rbe=beta./gm;
    Ri=1./gm;
    Av=gm*RC;
    Ai=1;

% -----------------------------------------

% buton circuit
B_circuitinitial=uicontrol( ...
        'Style','pushbutton',...
        'Units','normalized',...
        'Position',[0.05 0.25 0.15 0.05],...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'backgroundcolor', 'green',...
        'String','Circuit initial',...
        'Callback','imshow(imread("circuit_initial.jpeg"))');

% buton circuit echivalent in curent continu
B_curentcontinuu=uicontrol( ...
        'Style','pushbutton',...
        'Units','normalized',...
        'Position',[0.05 0.2 0.15 0.05],...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'backgroundcolor', 'green',...
        'String','Circuit echivalent in CC',...
        'Callback','imshow(imread("cc.jpeg"))');

% buton modelul de semnal mic
B_semnalmic=uicontrol('Style','pushbutton',...
        'Units','normalized',...
        'Position',[0.05 0.15 0.15 0.05],...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'backgroundcolor', 'green',...
        'String','Modelul de semnal mic',...
        'Callback','imshow(imread("semnal_mic.jpeg"))');

% buton inapoi
B_inapoi=uicontrol('Style','pushbutton',...
        'Units','normalized',...
        'Position',[0.8 0.075 0.15 0.05],...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'backgroundcolor', 'green',...
        'String','Back',...
        'Callback','close;paginaprincipala;');

% buton inchide
B_close=uicontrol('Style','pushbutton',...
        'Units','normalized',...
        'Position',[0.8 0.025 0.15 0.05],...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'backgroundcolor', 'green',...
        'String','Close',...
        'Callback','close;');

% -----------------------------------------

% grup de butoane: parametrii de semnal
RadioGroup1=uibuttongroup('Visible','on',...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'backgroundcolor', 'green',...
        'Title','Parametrii de semnal',...
        'TitlePosition','centertop',...
        'Tag','radiobutton',...
        'Position',[0.05 0.325 0.15 0.15]);

% label : A
St_A=uicontrol('Style','text',...
        'Units','normalized',...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'Position',[0.055 0.4 0.05 0.025],...
        'backgroundcolor', 'green',...
        'foregroundcolor','black',...
        'String','A');

% input: A
Be_A=uicontrol('Style','edit',...
        'Units','normalized',...
        'Position',[0.125 0.4 0.05 0.025],...
        'foregroundcolor','black',...
        'String',A,...
        'Callback','A=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');

% label: f
St_f=uicontrol('Style','text',...
        'Units','normalized',...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'Position',[0.055 0.375 0.05 0.025],...
        'backgroundcolor', 'green',...
        'Foregroundcolor','black',...
        'String','f');

% input: f
Be_f=uicontrol('Style','edit',...
        'Units','normalized',...
        'Position',[0.125 0.375 0.05 0.025],...
        'Foregroundcolor','black',...
        'String',f,...
        'Callback','f=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');

% label: N
St_N=uicontrol('Style','text',...
        'Units','normalized',...
        'Fontname', 'Times New Roman',...
        'Fontsize', 12,...
        'Position',[0.055 0.35 0.05 0.025],...
        'backgroundcolor', 'green',...
        'foregroundcolor','black',...
        'String','N');
```

```matlab
135    % input: N
136      Be_N=uicontrol('Style','edit',...
137        'Units','normalized',...
138        'Position',[0.125 0.35 0.05 0.025],...
139        'foregroundcolor','black',...
140        'String',N,...
141        'Callback','N=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');
142
143    % -----------------------------------------------
144
145      % grup de butoane: parametrii de intrare
146      RadioGroup2=uibuttongroup('Visible','on',...
147            'Fontname', 'Times New Roman',...
148            'Fontsize', 12,...
149            'backgroundcolor', 'green',...
150            'Title','Parametrii de intrare',...
151            'TitlePosition','centertop',...
152            'Tag','radiobutton',...
153            'Position',[0.05 0.75 0.15 0.225]);
154
155    % label: RB1
156      Bt_RB1=uicontrol('Style','text',...
157        'Units','normalized',...
158        'Fontname', 'Times New Roman',...
159        'Fontsize', 12,...
160        'Position',[0.055 0.9 0.05 0.025],...
161        'backgroundcolor', 'green',...
162        'foregroundcolor','black',...
163        'String','RB1');
164
165    % input: RB1
166      Be_RB1=uicontrol('Style','edit',...
167        'Units','normalized',...
168        'Position',[0.125 0.9 0.05 0.025],...
169        'foregroundcolor','black',...
170        'String',RB1,...
171        'Callback','RB1=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');
172
173    % label: RB2
174      Bt_RB2=uicontrol('Style','text',...
175        'Units','normalized',...
176        'Fontname', 'Times New Roman',...
177        'Fontsize', 12,...
178        'Position',[0.055 0.875 0.05 0.025],...
179        'backgroundcolor', 'green',...
180        'foregroundcolor','black',...
181        'String','RB2');

182    % input: RB2
183
184      Be_RB2=uicontrol('Style','edit',...
185        'Units','normalized',...
186        'Position',[0.125 0.875 0.05 0.025],...
187        'foregroundcolor','black',...
188        'String',RB2,...
189        'Callback','RB2=str2num(get(gco,''String''));close;tranzis...
190
191    % label: RC
192      Bt_RC=uicontrol('Style','text',...
193        'Units','normalized',...
194        'Fontname', 'Times New Roman',...
195        'Fontsize', 12,...
196        'Position',[0.055 0.85 0.05 0.025],...
197        'backgroundcolor', 'green',...
198        'foregroundcolor','black',...
199        'String','RC');
200
201    % input: RC
202      Be_RC=uicontrol('Style','edit',...
203        'Units','normalized',...
204        'Position',[0.125 0.85 0.05 0.025],...
205        'foregroundcolor','black',...
206        'String',RC,...
207        'Callback','RC=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');
208
209
210    % label: RE
211      Bt_RE=uicontrol('Style','text',...
212        'Units','normalized',...
213        'Fontname', 'Times New Roman',...
214        'Fontsize', 12,...
215        'Position',[0.055 0.825 0.05 0.025],...
216        'backgroundcolor', 'green',...
217        'foregroundcolor','black',...
218        'String','RE');
219
220    % input: RE
221      Be_RE=uicontrol('Style','edit',...
222        'Units','normalized',...
223        'Position',[0.125 0.825 0.05 0.025],...
224        'foregroundcolor','black',...
225        'String',RE,...
226        'Callback','RE=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');
227

228    % label: Beta
229      Bt_Beta=uicontrol('Style','text',...
230        'Units','normalized',...
231        'Fontname', 'Times New Roman',...
232        'Fontsize', 12,...
233        'Position',[0.055 0.8 0.05 0.025],...
234        'backgroundcolor', 'green',...
235        'foregroundcolor','black',...
236        'String','Beta');
237
238    % input: Beta
239      Be_Beta=uicontrol('Style','edit',...
240        'Units','normalized',...
241        'Position',[0.125 0.8 0.05 0.025],...
242        'foregroundcolor','black',...
243        'String',beta,...
244        'Callback','beta=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');
245
246    % label: VA1
247      Bt_VA1=uicontrol('Style','text',...
248        'Units','normalized',...
249        'Fontname', 'Times New Roman',...
250        'Fontsize', 12,...
251        'Position',[0.055 0.775 0.05 0.025],...
252        'backgroundcolor', 'green',...
253        'foregroundcolor','black',...
254        'String','VA1');
255
256    % input: VA1
257      Be_VA1=uicontrol('Style','edit',...
258        'Units','normalized',...
259        'Position',[0.125 0.775 0.05 0.025],...
260        'foregroundcolor','black',...
261        'String',VA1,...
262        'Callback','VA1=str2num(get(gco,''String''));close;tranzistor(A,f,N,RB1,RB2,RC,RE,beta,VA1);');
263
264    % -----------------------------------------------
265
266    % grup butoane: parametrii de iesire
267      RadioGroup3=uibuttongroup('Visible','on',...
268            'Fontname', 'Times New Roman',...
269            'Fontsize', 12,...
270            'backgroundcolor', 'green',...
271            'Title','Parametrii de iesire',...
272            'TitlePosition','centertop',...
273            'Tag','radiobutton',...
274            'Position',[0.05 0.5 0.15 0.225]);
```
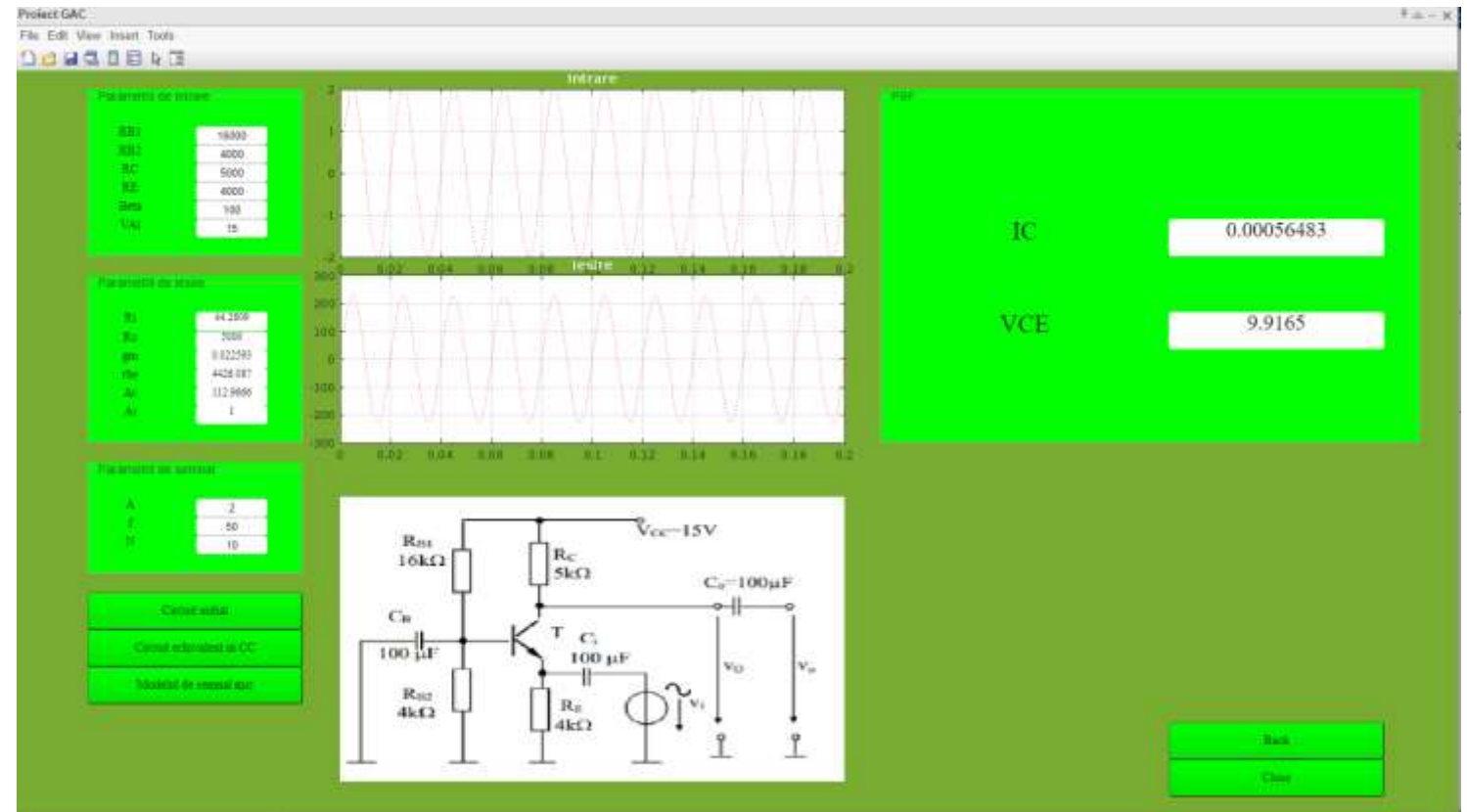
```matlab
275
276    % label: Ri
277    Bt_Ri=uicontrol('Style','text',...
278            'Units','normalized',...
279            'Fontname', 'Times New Roman',...
280            'Fontsize', 12,...
281            'Position',[0.055 0.65 0.05 0.025],...
282            'backgroundcolor', 'green',...
283            'foregroundcolor','black',...
284            'String','Ri');
285
286    % output: Ri
287    Bt_Ri1=uicontrol('Style','text',...
288        'Units','normalized',...
289        'Fontname', 'Times New Roman',...
290        'Fontsize', 10,...
291        'Position',[0.125 0.65 0.05 0.025],...
292        'backgroundcolor', 'w',...
293        'foregroundcolor','black',...
294        'String',num2str(Ri));
295
296    % label: Ro
297    Bt_Ro=uicontrol('Style','text',...
298            'Units','normalized',...
299            'Fontname', 'Times New Roman',...
300            'Fontsize', 12,...
301            'Position',[0.055 0.625 0.05 0.025],...
302            'backgroundcolor', 'green',...
303            'foregroundcolor','black',...
304            'String','Ro');
305
306    % output: Ro
307    Bt_Ro1=uicontrol('Style','text',...
308        'Units','normalized',...
309        'Fontname', 'Times New Roman',...
310        'Fontsize', 10,...
311        'Position',[0.125 0.625 0.05 0.025],...
312        'backgroundcolor', 'w',...
313        'foregroundcolor','black',...
314        'String',num2str(Ro));
315
316    % label: gm
317    Bt_gm=uicontrol('Style','text',...
318            'Units','normalized',...
319            'Fontname', 'Times New Roman',...
320            'Fontsize', 12,...
321            'Position',[0.055 0.6 0.05 0.025],...
322            'backgroundcolor', 'green',...
323            'foregroundcolor','black',...
324            'String','gm');
325
326    % output: gm
327    Bt_gm1=uicontrol('Style','text',...
328        'Units','normalized',...
329        'Fontname', 'Times New Roman',...
330        'Fontsize', 10,...
331        'Position',[0.125 0.6 0.05 0.025],...
332        'backgroundcolor', 'w',...
333        'foregroundcolor','black',...
334        'String',num2str(gm));
335
336    % label: rBE
337    Bt_rbe=uicontrol('Style','text',...
338            'Units','normalized',...
339            'Fontname', 'Times New Roman',...
340            'Fontsize', 12,...
341            'Position',[0.055 0.575 0.05 0.025],...
342            'backgroundcolor', 'green',...
343            'foregroundcolor','black',...
344            'String','rbe');
345
346    % output: rBE
347    Bt_rBE1=uicontrol('Style','text',...
348        'Units','normalized',...
349        'Fontname', 'Times New Roman',...
350        'Fontsize', 10,...
351        'Position',[0.125 0.575 0.05 0.025],...
352        'backgroundcolor', 'w',...
353        'foregroundcolor','black',...
354        'String',num2str(rbe));
355
356    % label: Av
357    Bt_Av=uicontrol('Style','text',...
358            'Units','normalized',...
359            'Fontname', 'Times New Roman',...
360            'Fontsize', 12,...
361            'Position',[0.055 0.55 0.05 0.025],...
362            'backgroundcolor', 'green',...
363            'foregroundcolor','black',...
364            'String','Av');
365
366    % output: Av
367    Bt_Av1=uicontrol('Style','text',...
368        'Units','normalized',...
369        'Fontname', 'Times New Roman',...
370        'Fontsize', 10,...
371        'Position',[0.125 0.55 0.05 0.025],...
372        'backgroundcolor', 'w',...
373        'foregroundcolor','black',...
374        'String',num2str(Av));
375
376    % label: Ai
377    Bt_Ai=uicontrol('Style','text',...
378        'Units','normalized',...
379        'Fontname', 'Times New Roman',...
380        'Fontsize', 12,...
381        'Position',[0.055 0.525 0.05 0.025]...
382        'backgroundcolor', 'green',...
383        'foregroundcolor','black',...
384        'String','Ai');
385
386    % output: Ai
387    Bt_Ri1=uicontrol('Style','text',...
388        'Units','normalized',...
389        'Fontname', 'Times New Roman',...
390        'Fontsize', 10,...
391        'Position',[0.125 0.525 0.05 0.025],...
392        'backgroundcolor', 'w',...
393        'foregroundcolor','black',...
394        'String',num2str(Ai));
395
396    % ------------------------------------------
397
398    % grup de butoane: PSF
399    RadioGroup4=uibuttongroup('Visible','on',...
400            'Fontname', 'Times New Roman',...
401            'Fontsize', 12,...
402            'backgroundcolor', 'green',...
403            'Title','PSF',...
404            'TitlePosition','centertop',...
405            'Tag','radiobutton',...
406            'Position',[0.6 0.5 0.375 0.475]
407
408    % label: IC
409    Bt_IC=uicontrol('Style','text',...
410        'Units','normalized',...
411        'Fontname', 'Times New Roman',...
412        'Fontsize', 24,...
413        'Position',[0.625 0.75 0.15 0.05],...
414        'backgroundcolor', 'green',...
415        'foregroundcolor','black',...
416        'String','IC');
417
418    % output: IC
419    Bt_IC1=uicontrol('Style','text',...
420        'Units','normalized',...
421        'Fontname', 'Times New Roman',...
422        'Fontsize', 20,...
423        'Position',[0.8 0.75 0.15 0.05],...
424        'backgroundcolor', 'w',...
425        'foregroundcolor','black',...
426        'String',num2str(IC));
427
428    % label: VCE
429    Bt_VCE=uicontrol('Style','text',...
430        'Units','normalized',...
431        'Fontname', 'Times New Roman',...
432        'Fontsize', 24,...
433        'Position',[0.625 0.625 0.15 0.05],...
434        'backgroundcolor', 'green',...
435        'foregroundcolor','black',...
436        'String','VCE');
437
438    % output: VCE
439    Bt_VCE1=uicontrol('Style','text',...
440        'Units','normalized',...
441        'Fontname', 'Times New Roman',...
442        'Fontsize', 20,...
443        'Position',[0.8 0.625 0.15 0.05],...
444        'backgroundcolor', 'w',...
445        'foregroundcolor','black',...
446        'String',num2str(VCE));
447
448    % ------------------------------------
449    T=1./f;
450    t=0:T/100:N*T;
451
452        % tip = sinus
453        vi=A.*sin(2.*pi.*f.*t);
454        vo=vi*Av;
455
456        subplot('position',[0.225 0.75 0.35 0.225]);
457        plot(t,vi);
458        grid on;
459        axis on;
460        title('Intrare', 'color','w','fontweight','normal');
461
462        subplot('position',[0.225 0.5 0.35 0.225]);
```
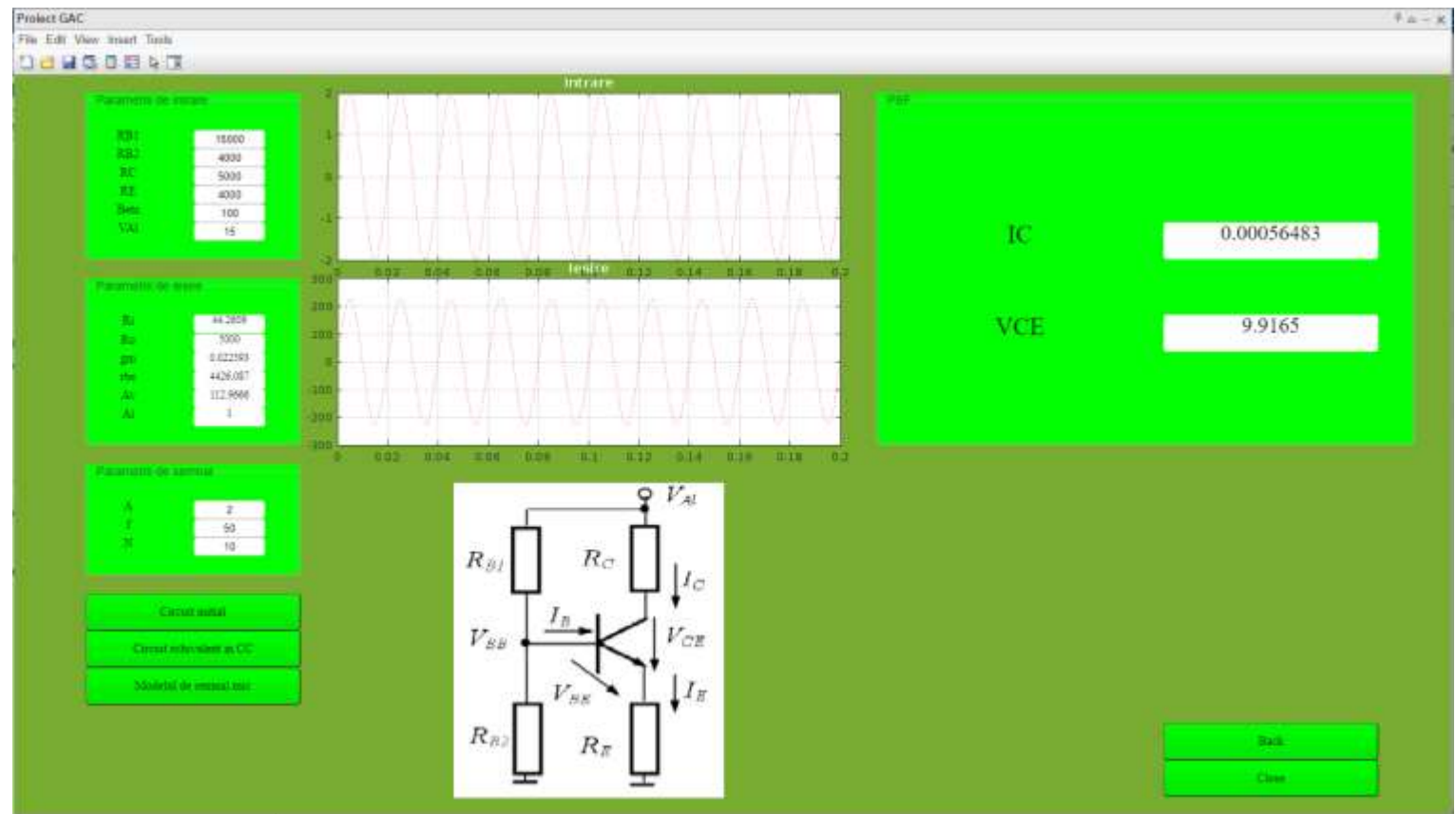
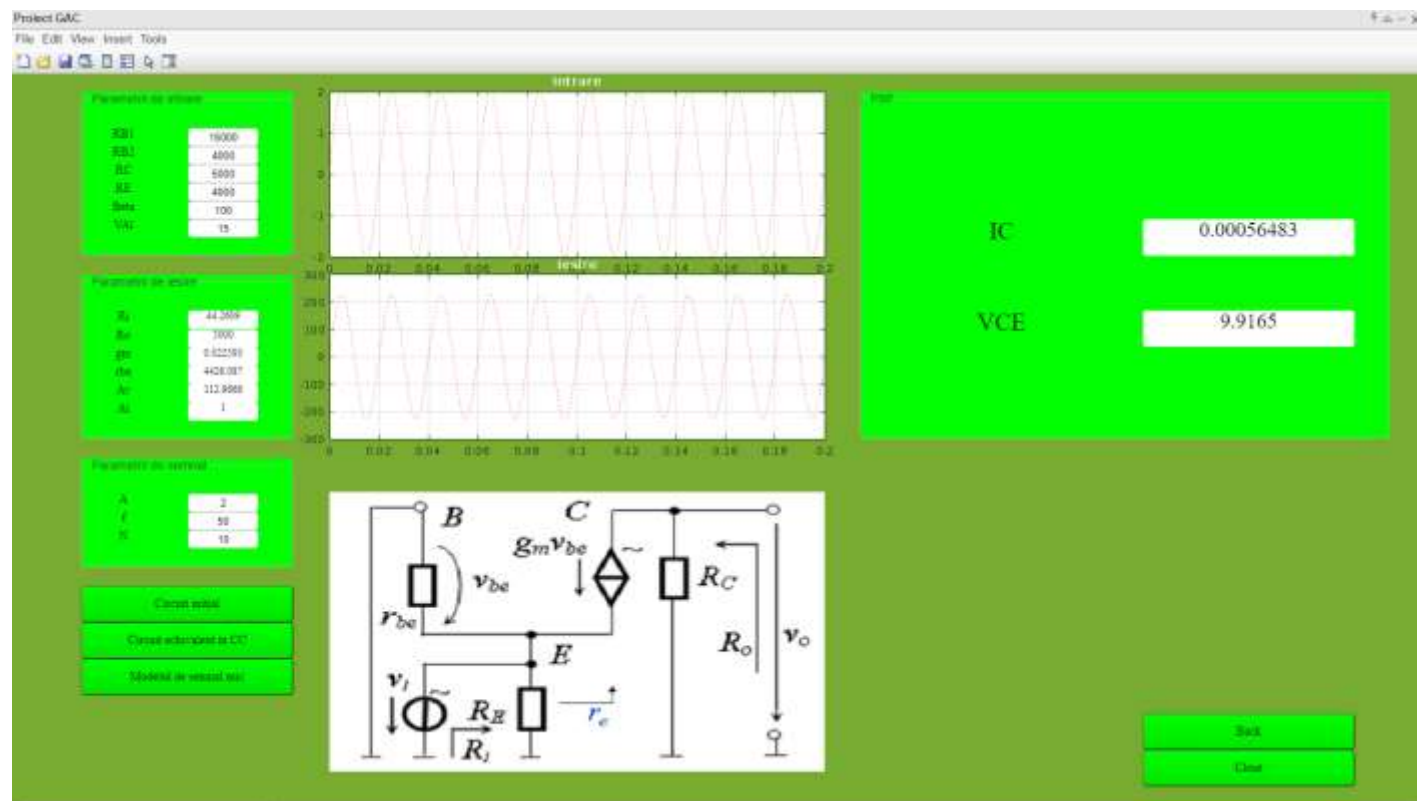# INTERFATA PROIECTULUI

PREZENTAREA CIRCUITULUI ECHIVALENT IN CURENT CONTINUU

PREZENTAREA MODELULUI DE SEMNAL MIC

Bibliografie:
-cursuri GAC: https://mce.utcluj.ro/
-cursuri CEF:
http://www.bel.utcluj.ro/dce/didactic/cef/