Contents

Usage of CRG_MAP_UV2UVV AND CRG_MAP_XY2XY

Introducing the usage of crg_map_uv2uv and crg_map_xy2xy. Examples are included. The file comments are optimized for the matlab publishing makro.

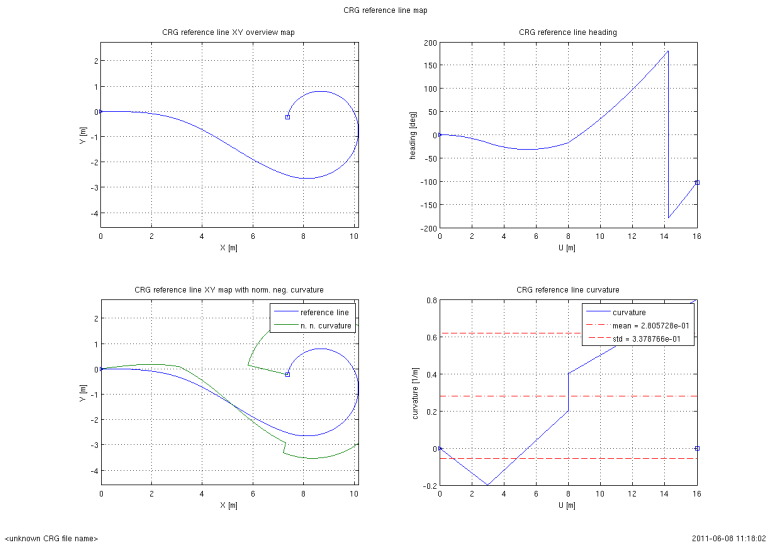
Test proceedings

- generate 0-z-crg file
- load test/real files
- FIRST: u,v maping (za(u,v) -> zb(u,v))
- SECOND: inertial x,y mapping (za(x,y) -> zb(x,y))
- display result

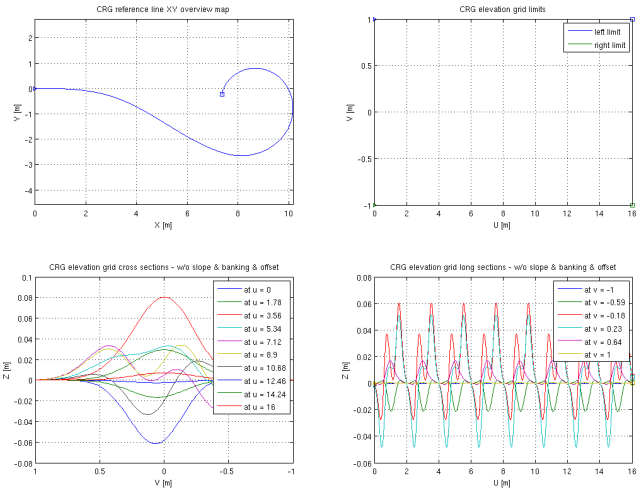
```
% DEFAULT SETTINGS
% clear enviroment
clear all;
close all;
```

Test1 (no additional parameter)

```
c = {  3   {   0  -0.2/3 }  ...    % klothoide
     ; 5   {-0.2   0.4/5 }  ...    % turning klothoide
     ; 8   { 0.4   0.4/8 }  ...    % circle
    };

dat1 = crg_gen_csb2crg0([], 16, 1, c);
dat2 = crg_read('demo1.crg');

data = crg_map_uv2uv(dat1,dat2);        % u,v mapping
crg_show(data);

data = crg_map_xy2xy(dat1,dat2);        % inertial mapping
crg_show(data);
```

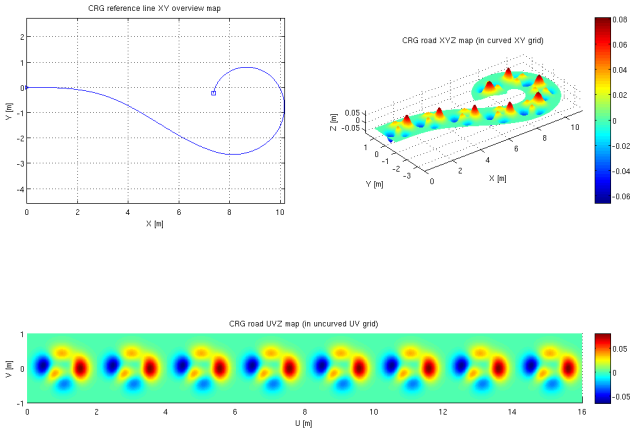


CRG elevation grid cuts and limits



<unknown CRG file name> 2011-06-08 11:18:04

CRG road surface



<unknown CRG file name> 2011-06-08 11:18:05

CRG information

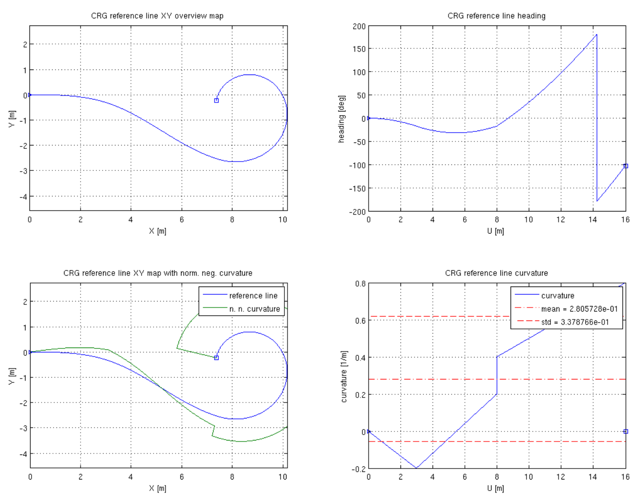
CRG elevation grid size:		
length	=	1601
width	=	201
CRG header data:		
reference line start u	=	0
reference line end u	=	16
reference line increment	=	0.01
long section v right	=	[illegible]
long section v left	=	[illegible]
long section v increment	=	0.01
reference line start x	=	0
reference line end x	=	[illegible]
reference line offset x	=	0
reference line start y	=	0
reference line end y	=	[illegible]
reference line offset y	=	0
reference line start s	=	0
reference line end s	=	0
reference line offset s	=	0
reference line start phi	=	0
reference line end phi	=	[illegible]
reference line offset phi	=	0
reference line start z	=	0
reference line end z	=	0
reference line start b	=	0
reference line end b	=	0
CRG modifier data:		
grid nan mode	=	[illegible]
refpoint u fraction	=	0
refpoint u offset	=	0
refpoint v	=	0
refpoint v offset	=	0
refpoint x	=	0
refpoint y	=	0
refpoint s	=	0
refpoint phi	=	0
CRG option data:		
border mode u	=	[illegible]
border mode v	=	[illegible]
border offset u	=	0
border offset v	=	0
border smooth ubeg	=	0
border smooth uend	=	0
refline continuation	=	0
refline search far	=	[illegible]
refline search close	=	[illegible]
check eps	=	[illegible]
check inc	=	[illegible]
check tol	=	[illegible]
CRG derived data:		
crossing ubeg	=	0
crossing uend	=	16
crossing ulen	=	0

CRG comment data:

CRG minimal artificial road and flat surface
... curvature added

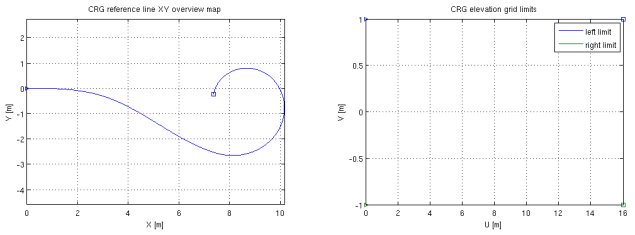
<unknown CRG file name> 2011-06-08 11:18:06

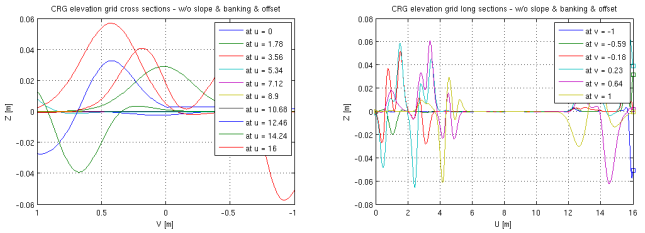
CRG reference line map



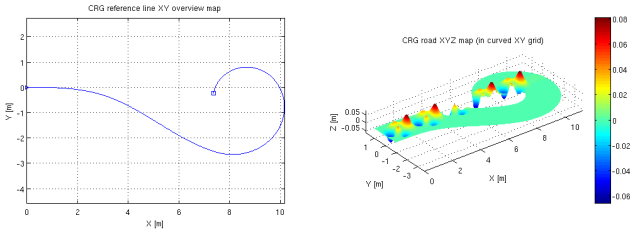
<unknown CRG file name> 2011-06-08 11:18:08

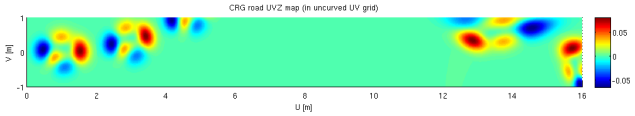
CRG elevation grid cuts and limits





CRG road surface





CRG elevation grid size:

length	=	3601
width	=	201

CRG header data:

reference line start u	=	0
reference line end u	=	36
reference line increment	=	0.01
long section v right	=	-1
long section v left	=	1
long section v increment	=	0.01
reference line start x	=	0
reference line end x	=	[illegible]
reference line offset x	=	0
reference line start y	=	0
reference line end y	=	[illegible]
reference line offset y	=	0
reference line start s	=	0
reference line end s	=	0
reference line offset s	=	0
reference line start phi	=	0
reference line end phi	=	[illegible]
reference line offset phi	=	0
reference line start z	=	0
reference line end z	=	0
reference line start b	=	0
reference line end b	=	0

CRG modifier data:

grid nan mode	=	2
refpoint u fraction	=	0
refpoint u offset	=	0
refpoint v	=	0
refpoint v offset	=	0
refpoint x	=	0
refpoint y	=	0
refpoint s	=	0
refpoint phi	=	0

CRG option data:

border mode u	=	2
border mode v	=	2
border offset u	=	0
border offset v	=	0
border smooth ubeg	=	0
border smooth uend	=	0
refline continuation	=	0
refline search far	=	1.5
refline search close	=	0.3
check eps	=	1e-06
check inc	=	0.001
check tol	=	0.0001

CRG derived data:

crossing ubeg	=	0
crossing uend	=	36
crossing ulen	=	0

CRG comment data:

CRG minimal artificial road and flat surface
... curvature added

<unknown CRG file name> 2011-06-08 11:18:11

Test2 (u-start/stop index)

```
c = {  3   {   0  -0.2/3 }  ...    % klothoide
     ; 5   {-0.2   0.4/5 }  ...    % turning klothoide
     ; 8   { 0.4   0.4/8 }  ...    % circle
    };

dat1 = crg_gen_csb2crg0([], 16, 1, c);
dat2 = crg_read('demo3.crg');

data = crg_map_uv2uv(dat1, dat2, [200 1000]);       % u,v mapping
crg_show(data);

data = crg_map_xy2xy(dat1,dat2, [200 1000]);        % inertial mapping
crg_show(data);
```

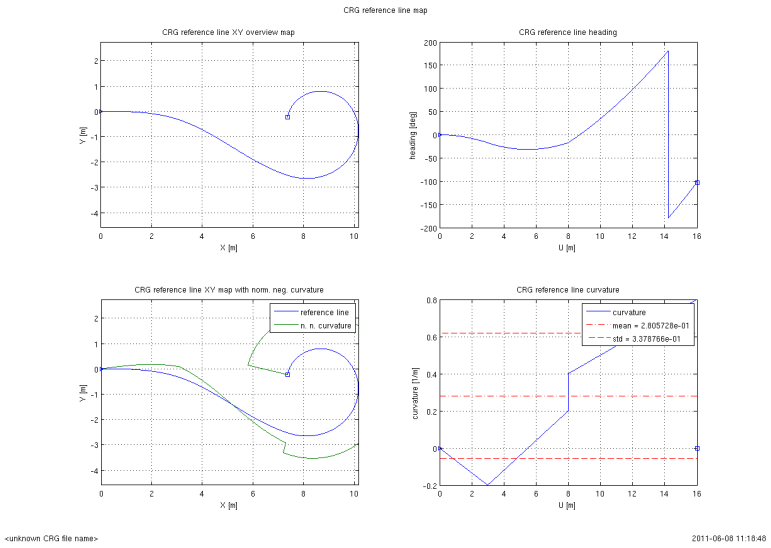
Test3 (v-start/stop index)

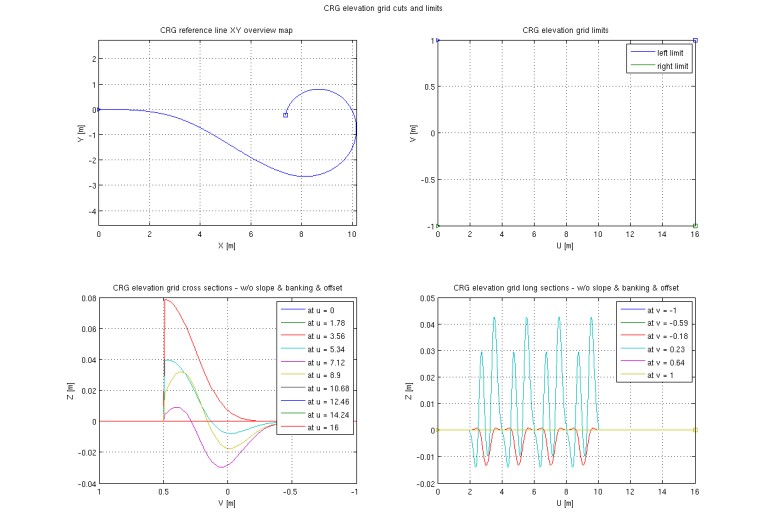
Border Mode is default

```
c = {  3   {   0  -0.2/3 }  ...    % klothoide
     ; 5   {-0.2   0.4/5 }  ...    % turning klothoide
     ; 8   { 0.4   0.4/8 }  ...    % circle
    };


dat1 = crg_gen_csb2crg0([], 16, 1, c);
dat2 = crg_read('demo1.crg');

data = crg_map_uv2uv(dat1, dat2, [], [70 110]);     % u,v mapping
crg_show(data);

data = crg_map_xy2xy(dat1,dat2, [], [20 75]);       % inertial mapping
crg_show(data);
```

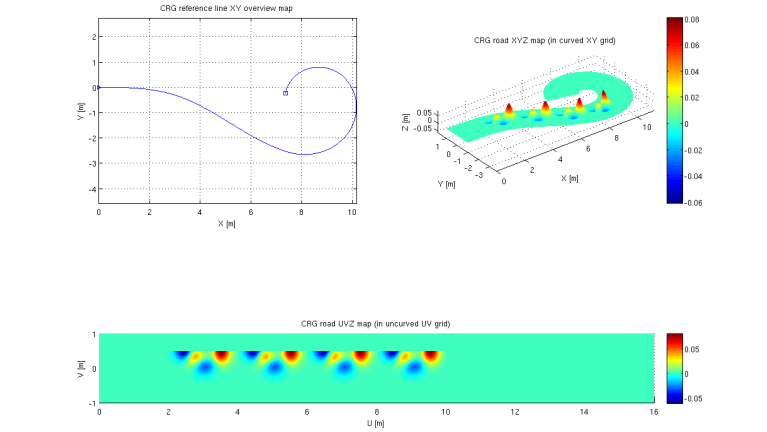
Test4 (u/v-start/stop index)

```
c = {  3   {   0  -0.2/3 }  ...    % klothoide
     ; 5   {-0.2   0.4/5 }  ...    % turning klothoide
     ; 8   { 0.4   0.4/8 }  ...    % circle
    };

dat1 = crg_gen_csb2crg0([], 16, 1, c);
dat2 = crg_read('demo1.crg');

data = crg_map_uv2uv(dat1, dat2, [200 1000], [50 150]); % u,v mapping
crg_show(data);

data = crg_map_xy2xy(dat1,dat2, [50 150], [20 50]);     % inertial mapping
crg_show(data);
```





<unknown CRG file name> 2011-06-08 11:18:49



<unknown CRG file name> 2011-06-08 11:18:49

CRG information

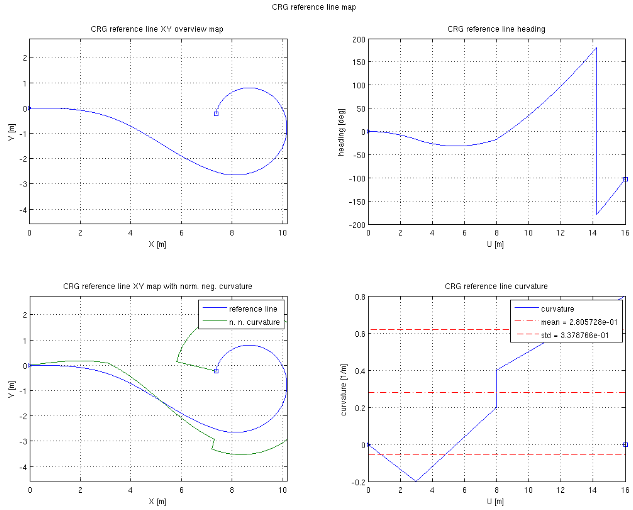
CRG elevation grid size:		
length	=	[illegible]
width	=	[illegible]
CRG header data:		
reference line start u	=	0
reference line end u	=	16
reference line increment	=	[illegible]
long section v right	=	[illegible]
long section v left	=	[illegible]
long section v increment	=	[illegible]
reference line start x	=	0
reference line end x	=	[illegible]
reference line offset x	=	0
reference line start y	=	0
reference line end y	=	[illegible]
reference line offset y	=	0
reference line start s	=	0
reference line end s	=	0
reference line offset s	=	0
reference line start phi	=	0
reference line end phi	=	[illegible]
reference line offset phi	=	0
reference line start z	=	0
reference line end z	=	0
reference line start b	=	0
reference line end b	=	0
CRG modifier data:		
grid nan mode	=	[illegible]
refpoint u fraction	=	0
refpoint u offset	=	0
refpoint v	=	0
refpoint v offset	=	0
refpoint x	=	0
refpoint y	=	0
refpoint s	=	0
refpoint phi	=	0
CRG option data:		
border mode u	=	[illegible]
border mode v	=	[illegible]
border offset u	=	0
border offset v	=	0
border smooth ubeg	=	0
border smooth uend	=	0
refline continuation	=	0
refline search far	=	[illegible]
refline search close	=	[illegible]
check eps	=	[illegible]
check inc	=	[illegible]
check tol	=	[illegible]
CRG derived data:		
crossing ubeg	=	0
crossing uend	=	16
crossing ulen	=	0

CRG comment data:

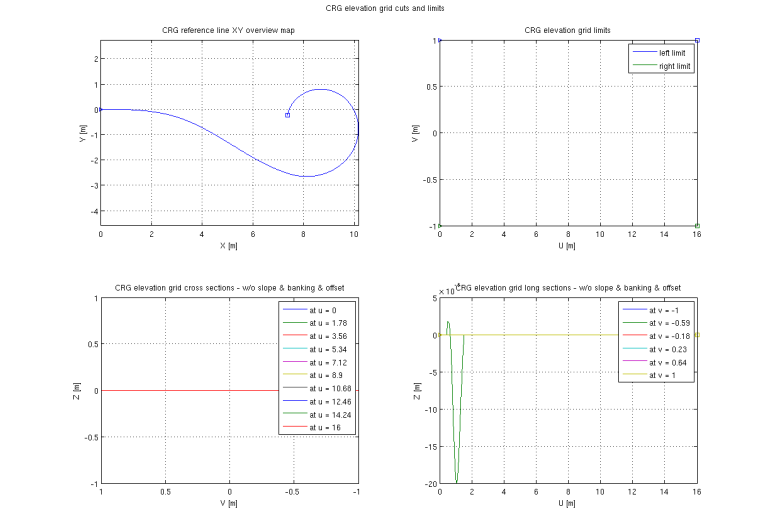
CRG minimal artificial road and flat surface
... curvature added

<unknown CRG file name> 2011-06-08 11:18:51

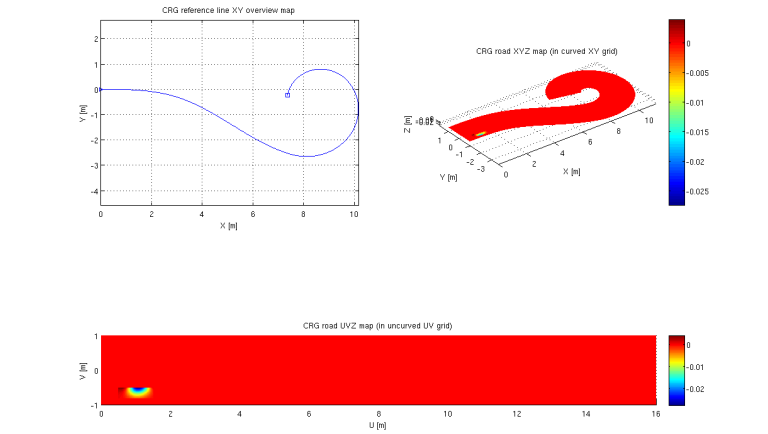
CRG reference line map



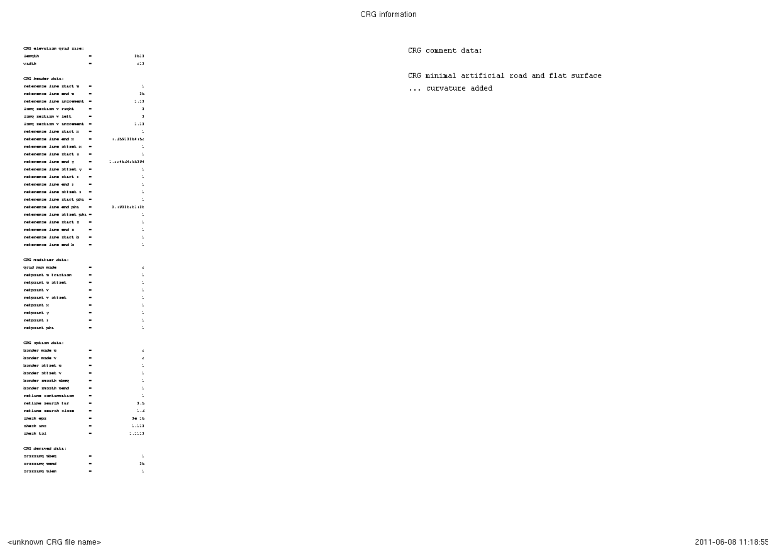
<unknown CRG file name> 2011-06-08 11:18:52



<unknown CRG file name> 2011-06-08 11:18:53

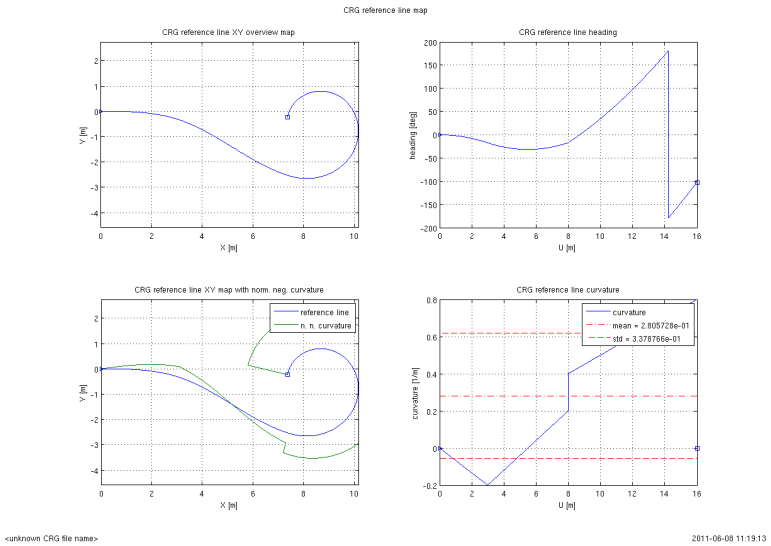


<unknown CRG file name> 2011-06-08 11:18:54

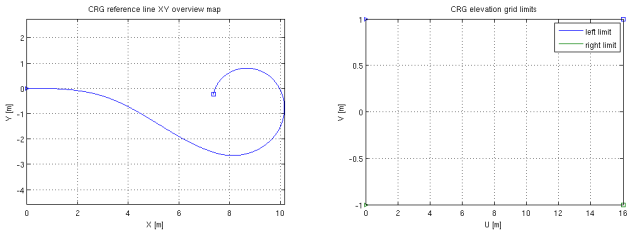

CRG information
CRG elevation grid size:
CRG header data:
CRG modifier data:
CRG option data:
CRG derived data:
CRG comment data:
CRG minimal artificial road and flat surface
... curvature added
<unknown CRG file name>
2011-06-08 11:18:55

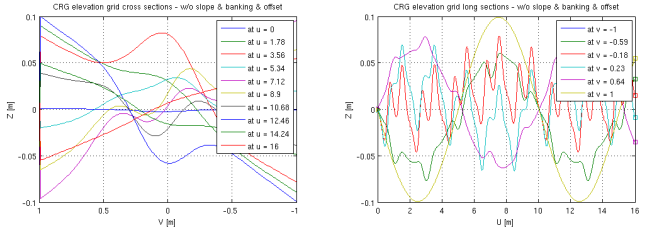
Test5 (add curved crg)

```
c = {  3   {   0  -0.2/3 }  ...    % klothoide
     ; 5   {-0.2   0.4/5 }  ...    % turning klothoide
     ; 8   { 0.4   0.4/8 }  ...    % circle
    };

dat1 = crg_gen_csb2crg0([], 16, 1, c);
dat2 = crg_read('demo7.crg');

data = crg_map_uv2uv(dat1, dat2);   % u,v mapping
crg_show(data);

data = crg_map_xy2xy(dat1,dat2);    % inertial mapping
crg_show(data);
```



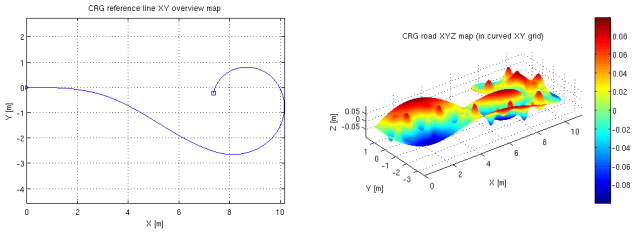
CRG elevation grid cuts and limits

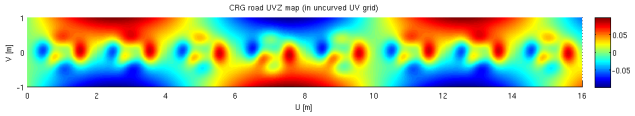




<unknown CRG file name> 2011-06-08 11:19:14

CRG road surface





<unknown CRG file name> 2011-06-08 11:19:15

CRG information

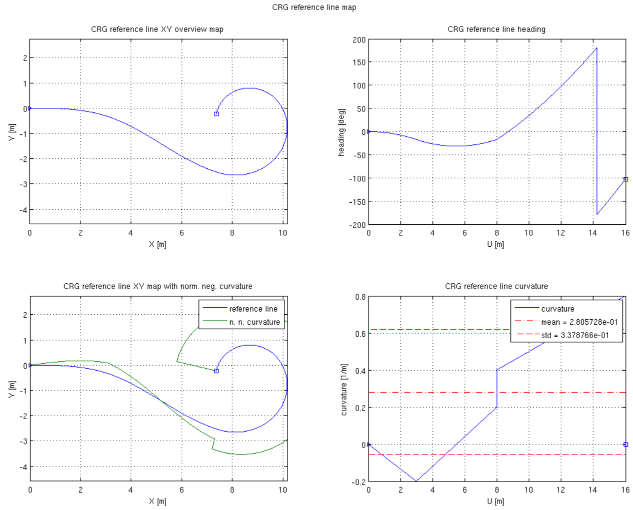
CRG elevation grid size:		
length	=	[illegible]
width	=	[illegible]
CRG header data:		
reference line start u	=	0
reference line end u	=	16
reference line increment	=	[illegible]
long section v right	=	[illegible]
long section v left	=	[illegible]
long section v increment	=	[illegible]
reference line start x	=	0
reference line end x	=	[illegible]
reference line offset x	=	0
reference line start y	=	0
reference line end y	=	[illegible]
reference line offset y	=	0
reference line start z	=	0
reference line end z	=	0
reference line offset z	=	0
reference line start phi	=	0
reference line end phi	=	[illegible]
reference line offset phi	=	0
reference line start s	=	0
reference line end s	=	0
reference line start b	=	0
reference line end b	=	0
CRG modifier data:		
grid nan mode	=	[illegible]
refpoint u fraction	=	0
refpoint u offset	=	0
refpoint v	=	0
refpoint v offset	=	0
refpoint x	=	0
refpoint y	=	0
refpoint z	=	0
refpoint phi	=	0
CRG option data:		
border mode u	=	[illegible]
border mode v	=	[illegible]
border offset u	=	0
border offset v	=	0
border smooth ubeg	=	0
border smooth uend	=	0
refline continuation	=	0
refline search far	=	[illegible]
refline search close	=	[illegible]
check eps	=	[illegible]
check inc	=	[illegible]
check tol	=	[illegible]
CRG derived data:		
crossing ubeg	=	0
crossing uend	=	16
crossing ulen	=	0

CRG comment data:

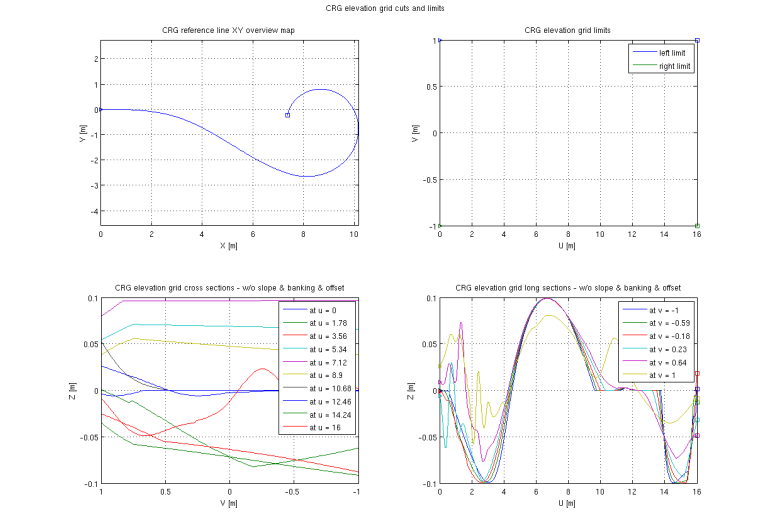
CRG minimal artificial road and flat surface
... curvature added

<unknown CRG file name> 2011-06-08 11:19:16

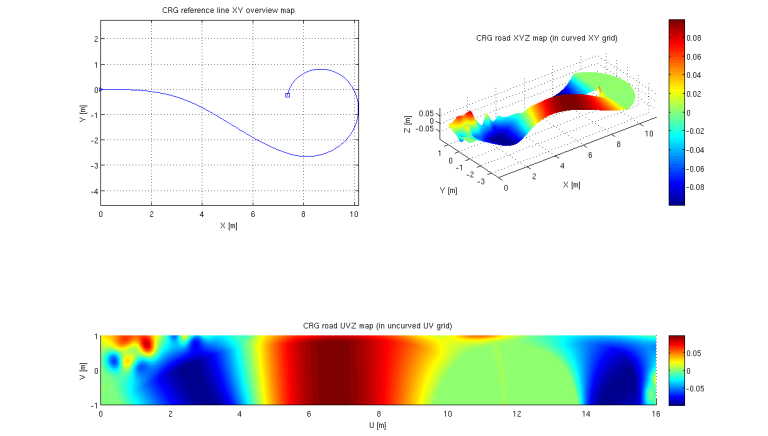
CRG reference line map



<unknown CRG file name> 2011-06-08 11:19:34



<unknown CRG file name> 2011-06-08 11:19:35



<unknown CRG file name> 2011-06-08 11:19:36

```
CRG elevation grid size:
length                      =          36.0
width                       =           [illegible]

CRG header data:
reference line start u      =             0
reference line end u        =            36
reference line increment    =          0.01
long section v right        =             0
long section v left         =             0
long section v increment    =          0.01
reference line start x      =             0
reference line end x        =   [illegible]
reference line offset x     =             0
reference line start y      =             0
reference line end y        =   [illegible]
reference line offset y     =             0
reference line start z      =             0
reference line end z        =             0
reference line offset z     =             0
reference line start phi    =             0
reference line end phi      =   [illegible]
reference line offset phi   =             0
reference line start s      =             0
reference line end s        =             0
reference line start b      =             0
reference line end b        =             0

CRG modifier data:
grid nan mode               =             2
refpoint u fraction         =             0
refpoint u offset           =             0
refpoint v                  =             0
refpoint v offset           =             0
refpoint x                  =             0
refpoint y                  =             0
refpoint z                  =             0
refpoint phi                =             0

CRG option data:
border mode u               =             2
border mode v               =             2
border offset u             =             0
border offset v             =             0
border smooth ubeg          =             0
border smooth uend          =             0
refline continuation        =             0
refline search far          =           1.5
refline search close        =           0.5
check eps                   =         1e-06
check inc                   =         0.001
check tol                   =        0.0001

CRG derived data:
crossing ubeg               =             0
crossing uend               =            36
crossing ulen               =             0
```

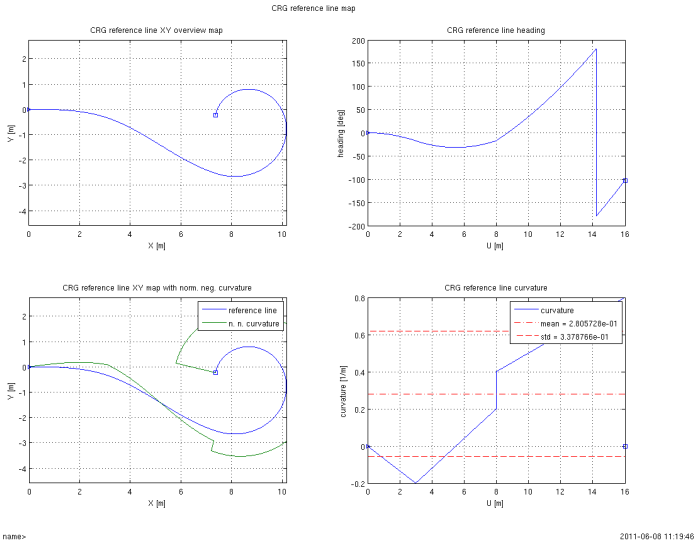
CRG comment data:

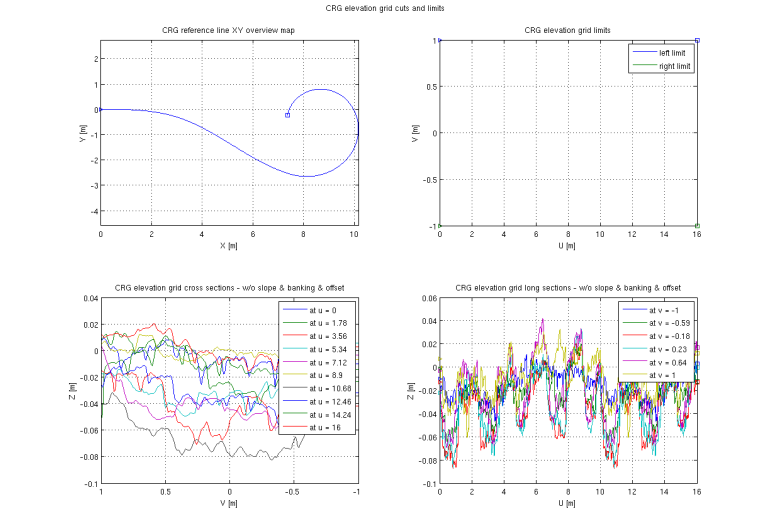
CRG minimal artificial road and flat surface
... curvature added

<unknown CRG file name> 2011-06-08 11:19:37

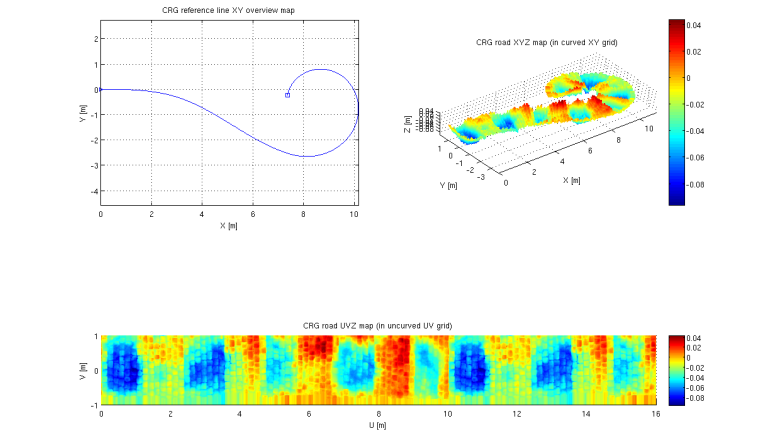
Test6 (adding real dataset)

```
c = {  3   {   0  -0.2/3 }  ...    % klothoide
     ; 5   {-0.2   0.4/5 }  ...    % turning klothoide
     ; 8   { 0.4   0.4/8 }  ...    % circle
    };

dat1 = crg_gen_csb2crg0([], 16, 1, c);
dat2 = crg_read('../crg-bin/belgian_block.crg');

dat2.mods.rptx = 1;
dat2.mods.rpty = 1;
dat4 = crg_mods(dat2);

data = crg_map_uv2uv(dat1, dat4 );    % u,v mapping
crg_show(data);

data = crg_map_xy2xy(dat1,dat4 );     % inertial mapping
crg_show(data);
```

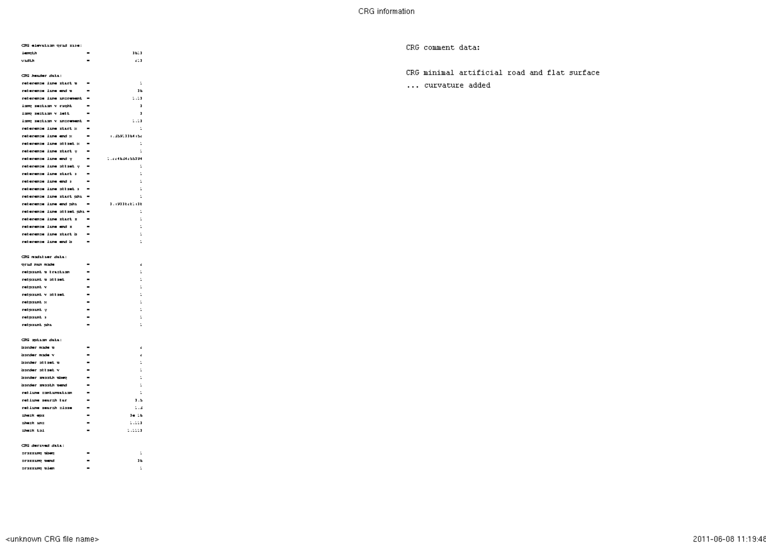


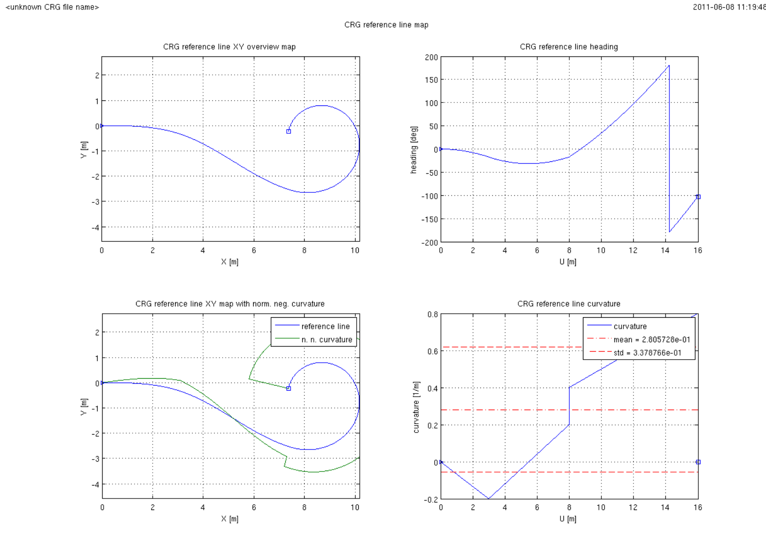


<unknown CRG file name> 2011-06-08 11:19:46

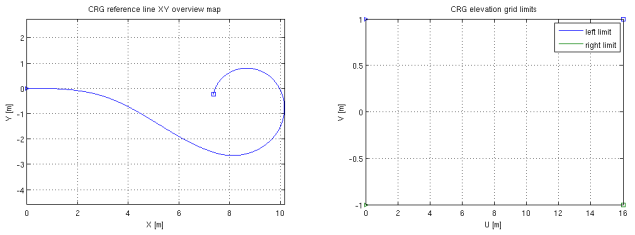


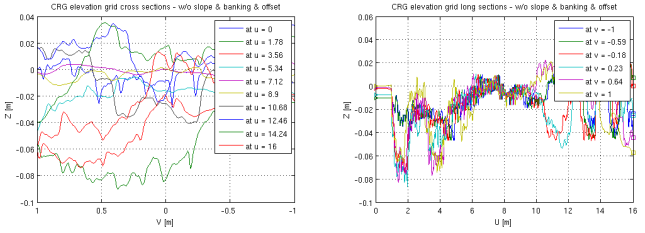
<unknown CRG file name> 2011-06-08 11:19:47


CRG information
CRG comment data:
CRG minimal artificial road and flat surface
... curvature added
<unknown CRG file name>
2011-06-08 11:19:48

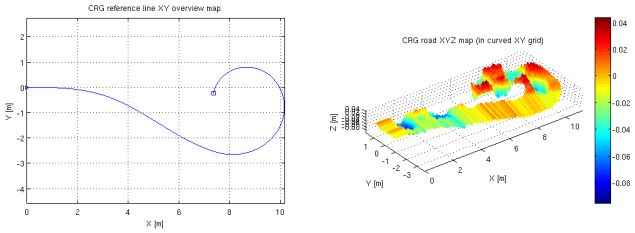

CRG reference line map
CRG reference line XY overview map
X [m]
Y [m]
CRG reference line heading
U [m]
heading [deg]
CRG reference line XY map with norm. neg. curvature
reference line
n. n. curvature
CRG reference line curvature
curvature
mean = 2.805728e-01
std = 3.378766e-01
curvature [1/m]
<unknown CRG file name>
2011-06-08 11:19:54

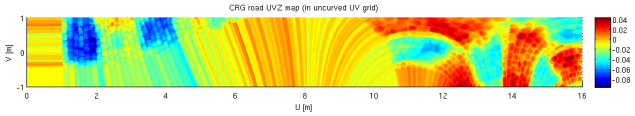
CRG elevation grid cuts and limits





CRG road surface





CRG information

CRG elevation grid size:		
length	=	36.0
width	=	2.0
CRG header data:		
reference line start u	=	0
reference line end u	=	36
reference line increment	=	0.10
long section v right	=	1
long section v left	=	1
long section v increment	=	0.10
reference line start x	=	0
reference line end x	=	[illegible]
reference line offset x	=	0
reference line start y	=	0
reference line end y	=	[illegible]
reference line offset y	=	0
reference line start z	=	0
reference line end z	=	0
reference line offset z	=	0
reference line start phi	=	0
reference line end phi	=	[illegible]
reference line offset phi	=	0
reference line start s	=	0
reference line end s	=	0
reference line start b	=	0
reference line end b	=	0
CRG modifier data:		
grid nan mode	=	2
refpoint u fraction	=	0
refpoint u offset	=	0
refpoint v	=	0
refpoint v offset	=	0
refpoint x	=	0
refpoint y	=	0
refpoint z	=	0
refpoint phi	=	0
CRG option data:		
border mode u	=	2
border mode v	=	2
border offset u	=	0
border offset v	=	0
border smooth ubeg	=	0
border smooth uend	=	0
refline continuation	=	0
refline search far	=	1.5
refline search close	=	0.3
check eps	=	1e-06
check inc	=	0.001
check tol	=	0.0001
CRG derived data:		
crossing ubeg	=	0
crossing uend	=	36
crossing ulen	=	0

CRG comment data:

CRG minimal artificial road and flat surface
... curvature added