

```

% ..... Mercator Projection .....
close all, clear, clf;
CoLoR = [0.6 0.6 0.55];
set(gcf,'color',CoLoR );
disp(['ooooooooooooo S T A R T oooooooooooooo ',date, ' oooooooooooooo'])
% .....
% >> We create some locations:
% ::: Chemnitz : lat = 50.50; lon = 12.55
Chem = [50.5 12.55];
% >> GPS positions (latitude,longitude) of some markers
data = [
-22.976730, - 43.195080 ;
55.756950, 37.614975 ;
33.605381, - 7.631940 ;
35.670479, 139.740921 ;
51.506325, - 0.127144 ;
40.714550, - 74.007124 ;
-33.869629, 151.206955 ;
-26.204944, 28.040035 ;
37.777125, -122.419644 ;
30.083740, 31.255360 ;
6.439180, 3.423480
Chem(1), Chem(2)];
labels =
{ 'Rio de Janeiro'
'Moscow'
'Casablanca'
'Tokyo'
'London'
'New York'
'Sydney'
'Johannesburg'
'San Francisco'
'Cairo'
'Lagos'
'Chem'};

% >> Next we load a map from Wikipedia, world map in Mercator projection
C = 'MercatorCoastLines.jpg';
% .....
imgC = imread(C); % einlesen : Mercator = 700x553
[imgHc,imgWc,kc] = size(imgC);
% .....
imgHc
imgWc
% ::::: Mercator projection
[x,y] = mercatorProjection(data(:,2), data(:,1), imgWc, imgHc); % ← die hier ungenau
image(imgC),
title('\bf Map size : 700x553', 'FontSize', 12);
hold on
% ::::: overlay plot with markers
plot(x,y, 'ro', 'MarkerSize',6, 'LineWidth',2);
text(x, y, labels, 'Color','w', 'VerticalAlign','bottom', 'HorizontalAlign','right');
disp('=====')
% ::::: meine - Uwe's Versuche :::::
% ::::: sample Geo - Cities : some Lat & Lon- Angles .....
[data; Chem];
% ::::: values in "Radians" (Bogenmaß) :::::
Radi = pi/180* [ data ];
az = Radi(:, 1); % > Azimuth
el = Radi(:, 2); % > Elevation
% ::::: transforming :::::
xx = az*imgWc;
yy = log(tan(pi/4+el/2))*imgHc; % ← hier steckt der „große“ Wurm drin
% .....
figure
image(imgC),
hold on
% ::::: overlay plot with markers :::::
plot(xx,yy, 'go', 'MarkerSize',6, 'LineWidth',2);
text(xx,yy, labels, 'Color','w', 'VerticalAlign','bottom', 'HorizontalAlign','right');

```

**MATLAB**

File Edit View Web Window Help

Current Directory: C:\Dokumente und Einstellungen\Koernig\_Uwe\Eigene Dateien\Matlab\\_Matlab\_Sim\_Verteilgn\_Geometrie + Geo.-I

Workspace

Name	Size	Bytes	Class
abc	1x22	44	char arra
Chem	1x2	16	double ar
CoLoR	1x3	24	double ar
Radi	12x2	192	double ar
ans	13x2	208	double ar
az	12x1	96	double ar
data	12x2	192	double ar
el	12x1	96	double ar
imgC	553x700x3	1161300	uint8 arra
imgHc	1x1	8	double ar
imgWc	1x1	8	double ar
kc	1x1	8	double ar
labels	12x1	908	cell array
x	12x1	96	double ar
xx	12x1	96	double ar
y	12x1	96	double ar
yy	12x1	192	double ar

Command Window

```

>>
>>
>>
>> ..... S T A R T ..... 28-Oct-2013 .....
imgHc =
    553
imgWc =
    700
=====
Warning: Imaginary parts of complex X and/or Y arguments ignored.
> In C:\Dokumente und Einstellungen\Koernig_Uwe\Eigene Dateien\Matlab\_Matlab_Sim_Verteilgn_Geometrie + Geo.-Koord. + Maps\_Geo Maps + Data\_A_geo_Mercator_CoastLines_.m at line 68
>>
>> YY
YY =
   -463.14
    392.34
   -73.88
  425.16 + 1737.3i
   -1.2272
  -1085.4
    290.4 + 1737.3i
    282.13
  -683.19 + 1737.3i
    317.85
    33.062
    122.11
>>

```

Command H

Vgl\_Table =

Vgl\_Table =

Vgl\_Table =

help regex

Y

YY

Current Directory

\Dokumente

All Files File I

Axesm\_Map Folder

A\_all\_Worldmap... M-file

A\_ascii\_datei... M-file

Start

3 matlab

new CD audio...

Windows Media Pl...

21:55

Current Directory: C:\Dokumente und Einstellungen\Koernig\_Uwe\Eigene Dateien\Matlab\\_Matlab\_Sim\_Verteilgn\_Geometrie + Geo.-I

Workspace

Name	Size	Bytes	Class
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imgC	553x700x3	1161300	uint8 arra
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labels	12x1	908	cell
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yy	12x1	192	dou

Command Window

```

>>
>> ..... S T A R T ..... 28-Oct-2013 .....
imgHc =
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>>

```

Command H

Vgl\_Table =

Vgl\_Table =

Vgl\_Table =

help regex

Y

YY

Current Directory

\Dokumente

All Files Fil

Axesm\_Map Fol

A\_all\_Worldmap... M-f

A\_ascii\_datei... M-f

Start

3 matlab

new CD a...

Windows Medi...

Dokument1 - ...

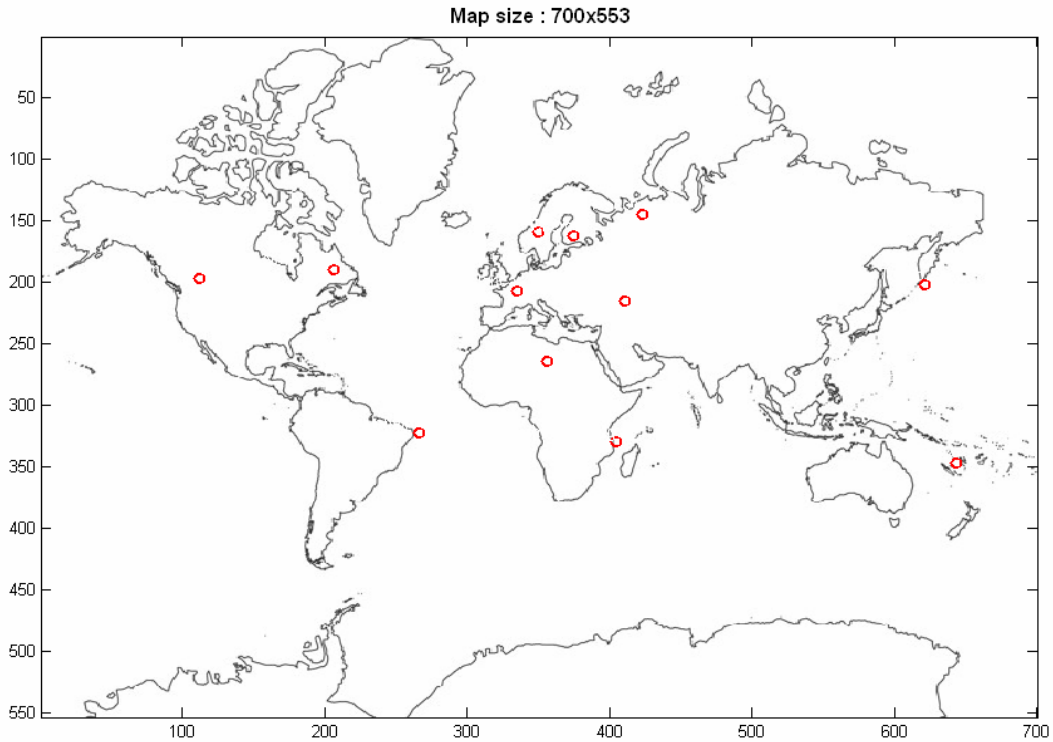
21:56

54 % ..... sample Geo - Cities : some Lat & Lon- Angles .....  
55 [data; Chem];  
56 % ..... values in "Radians" (Bogenmaß) .....  
57 Radi = pi/180\* [ data ];  
58 az = Radi(:, 1); % > Azimuth  
59 el = Radi(:, 2); % > Elevation  
60 % ..... transforming .....  
61 xx = az\*imgWc;  
62 yy = log(tan(pi/4+el/2))\*imgHc;  
63 % .....  
64 figure  
65 image(imgC),  
66 hold on  
67 % ..... overlay plot with markers .....  
68 plot(xx,yy, 'go', 'MarkerSize',6, 'LineWidth',2);  
69 text(xx,yy, labels, 'Color','w', 'VerticalAlign','bottom', 'HorizontalAlign','right');

**function [x,y] = mercatorProj(lon, lat, width, height)**

```
% ::::::::::::::::::::::::::::::: transforming :::::::::::::::::::::::  
x = mod((lon+180)*width/360, width) ;  
y = height/2 - log(tan((lat+90)*pi/360))*width/(2*pi);  
end
```

hier im Modell ungenau : alle Locations **leicht nach oben und rechts** verschoben



berechnet mit :  $xx = az * imgWc;$   
 $yy = \log(\tan(\pi/4 + e/2)) * imgHc;$

mit dieser **Buch - Formel** >>> passt hier dann gar nixxx mehr

