

# Introduction to SwanOne

- **SWAN** is a third generation wave model that computes random, short-crested wind-generated waves in coastal regions and inland waters.  
(for more information see <http://vlm089.citg.tudelft.nl/swan/index.htm>)
- **SwanOne** is an interface to simplify one-dimensional wave modelling problems and is written as a series of MATLAB routines (M-files).

*SwanOne can be run in two modes:*

1. In a MATLAB platform (any version)
2. As a stand-alone executable file

# Introduction to SwanOne

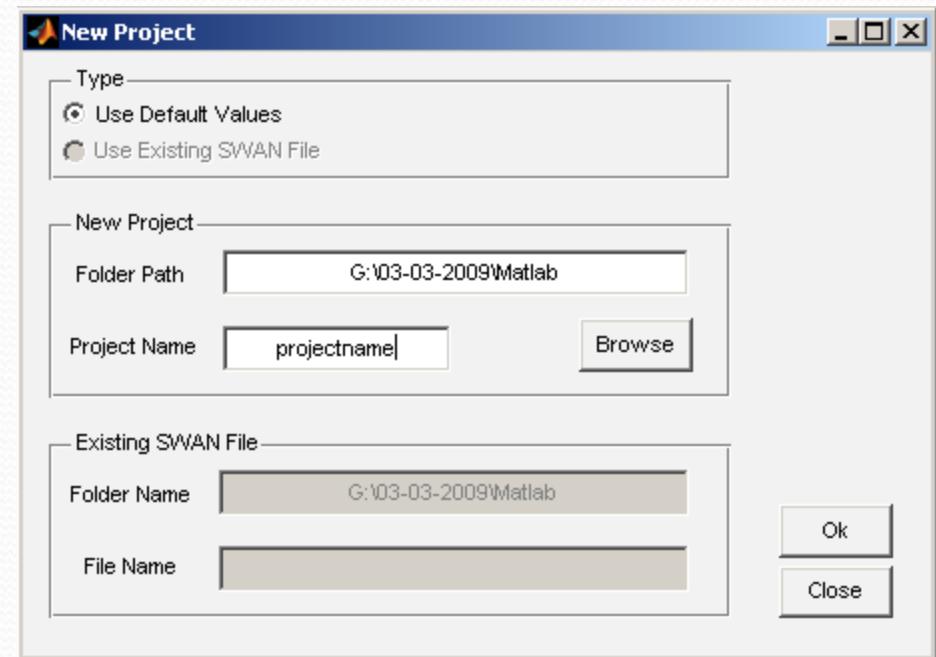
- **In a MATLAB platform**
  1. Open MATLAB (any Version).
  2. Make the folder containing SwanOne MATLAB scripts as the current directory of MATLAB.
  3. Run SwanOne.m (M-File) and start working.
- **As a stand-alone executable file:**
  1. Needs MATLAB Runtime Component (MCRinstaller77.exe), already installed on your computer. (or the same MCRinstaller.exe of MATLAB version that the program has been compiled with!)  
(See Manual <http://www.kennisbank-waterbouw.nl/Software/SwanOne%20User%20manual.pdf>)
  2. You may compile it yourself with your own version of MATLAB!

# Starting a Project with SwanOne

**Folder Path:** Defines where you want the SwanOne input files and output files stored (you may not see any file until you run the computation)

**Projectname:** All the input and output files will start with this projectname

\* *Using a previously-run project  
is not active yet!*



# Inputs of SwanOne

- **Bottom Profile**

“filename.txt” layout of such a file is  
as follows:

*Column1* : Distance from the Offshore  
Boundary

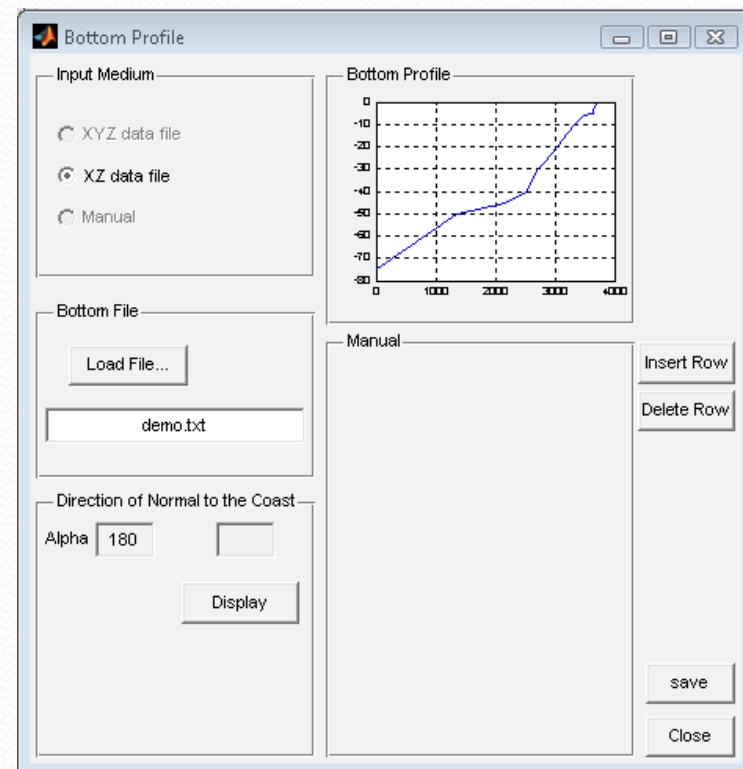
*Column2*: Depth  
*“Negative Downward”*

Alpha is the direction of the normal to  
the coast line (Default 180 °)

\* *Manual option is not active yet!*

Note % sign  
(Comment symbol  
in MATLAB)

	%	Xp (m)	Yp (m)
1		0	-100
2		200	-75
3		344	-56
4		500	0

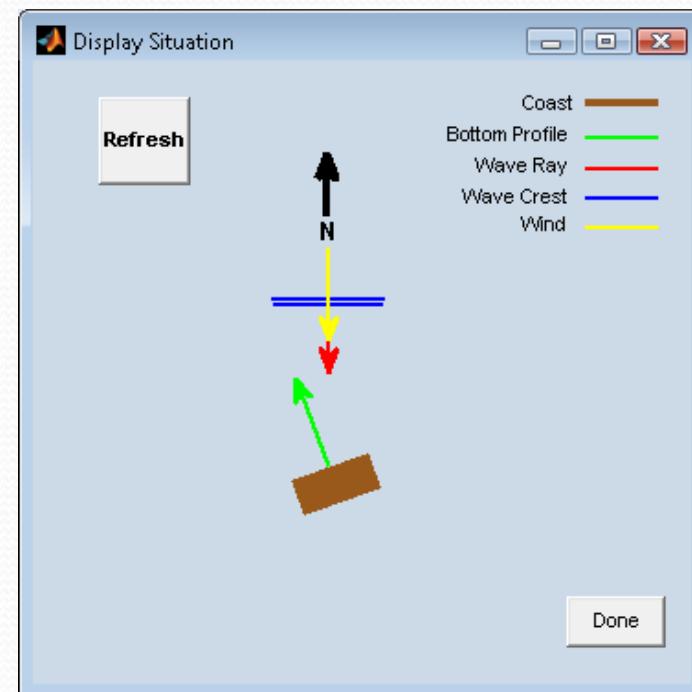


# Inputs of SwanOne

- Nautical Convention of SWAN is used in SwanOne:

***“Zero degree is looking from north to south and increases clockwise”***

- The Difference between the wave ray and bottom profile cannot be more than 70 degrees.



# Inputs of SwanOne

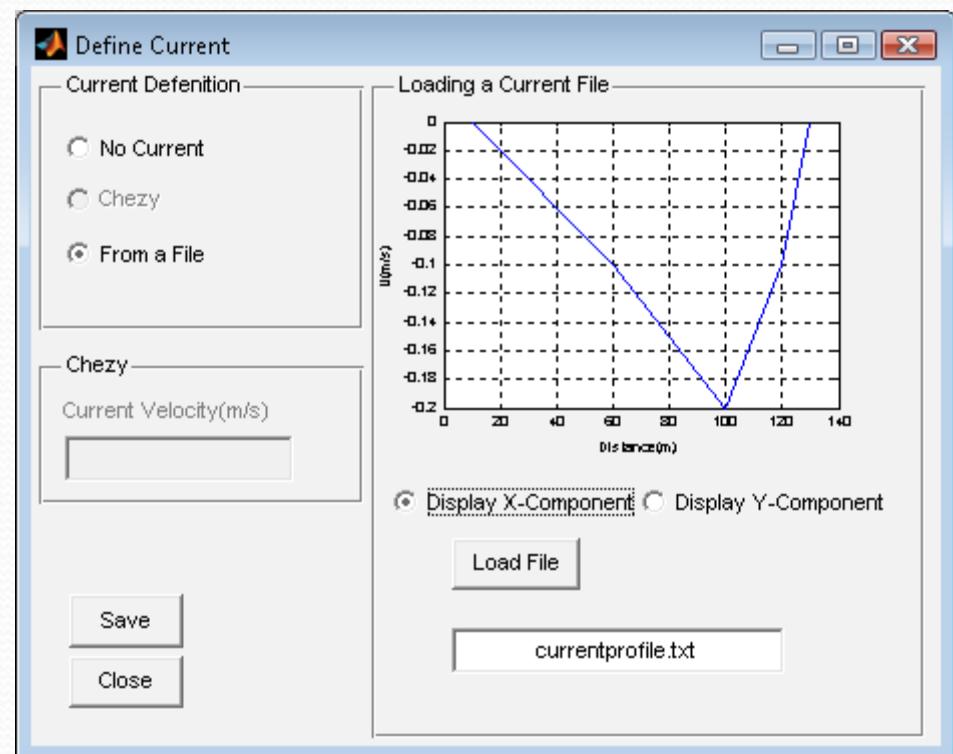
- **Current Profile:**

“*CurrentProfile.txt*” layout of such a file must be as follows:

*Column1:* distance from the offshore boundary

*Column2:* X-component of current velocities perpendicular to the bottom profile)

*Column3:* Z-component of current velocities (parallel to the bottom profile)

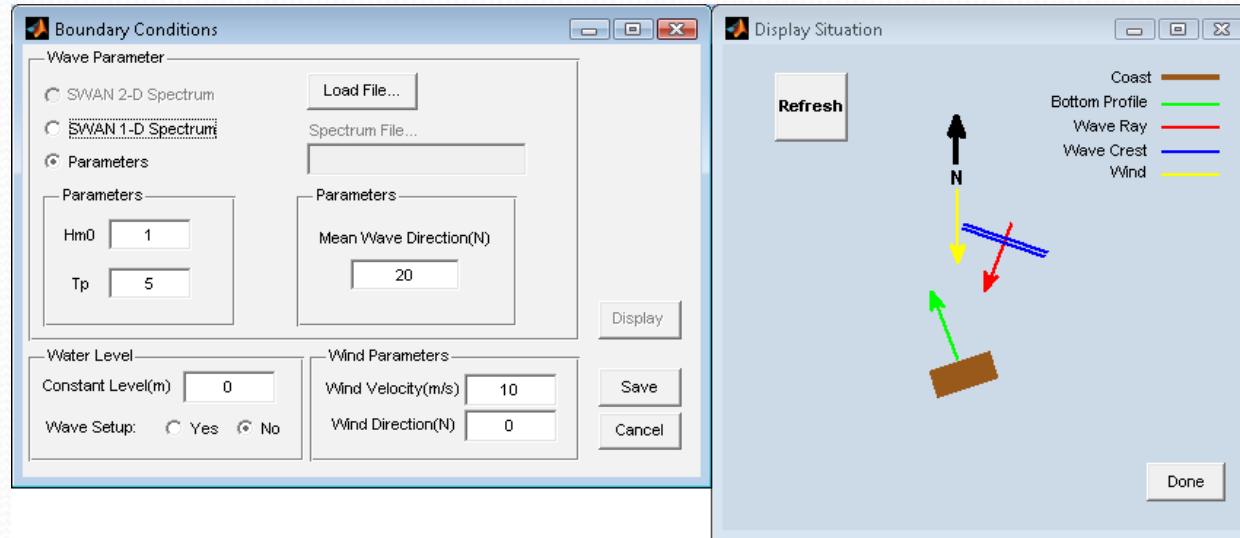


**\*Current velocities outside the defined area are assumed to be zero!**

# Inputs of SwanOne

## Boundary Conditions:

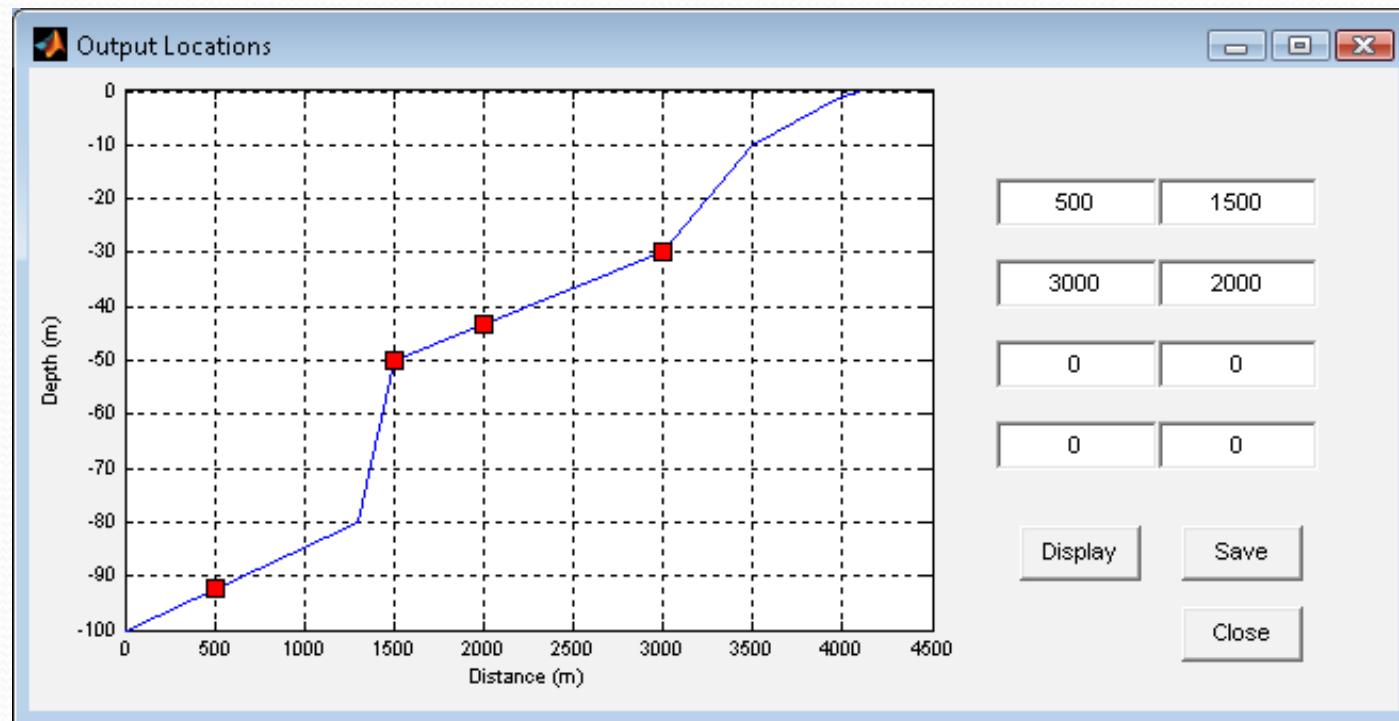
- *SP1 file*: one-dimensional spectrum file already computed by SWAN.
- *Wave Parameters*:
  - Significant Wave Height,
  - Peak Period,
  - Wind Direction and Velocity
  - Wave Direction



# Inputs of SwanOne

## Output Locations:

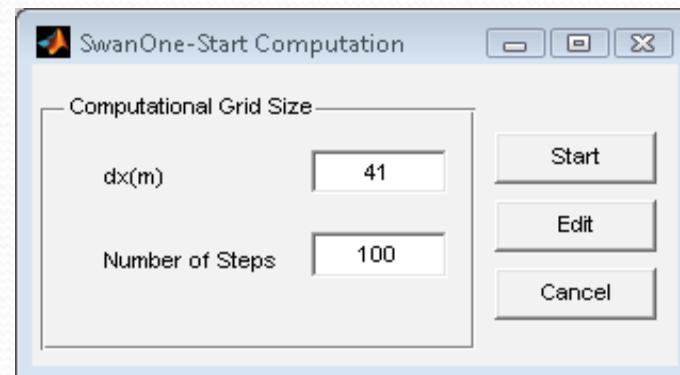
- for SP1 and SP2 output files of SWAN, at least one location is needed.



# Inputs of SwanOne

## Starting Computation:

- You may change the Computation Resolution in the *SwanOne- Start Computation* window.
- SWAN reads the “Projectname.SWN”, and runs the model.
- The results will be stored in the directory that was already defined.



# Computation

## What SwanOne Creates:

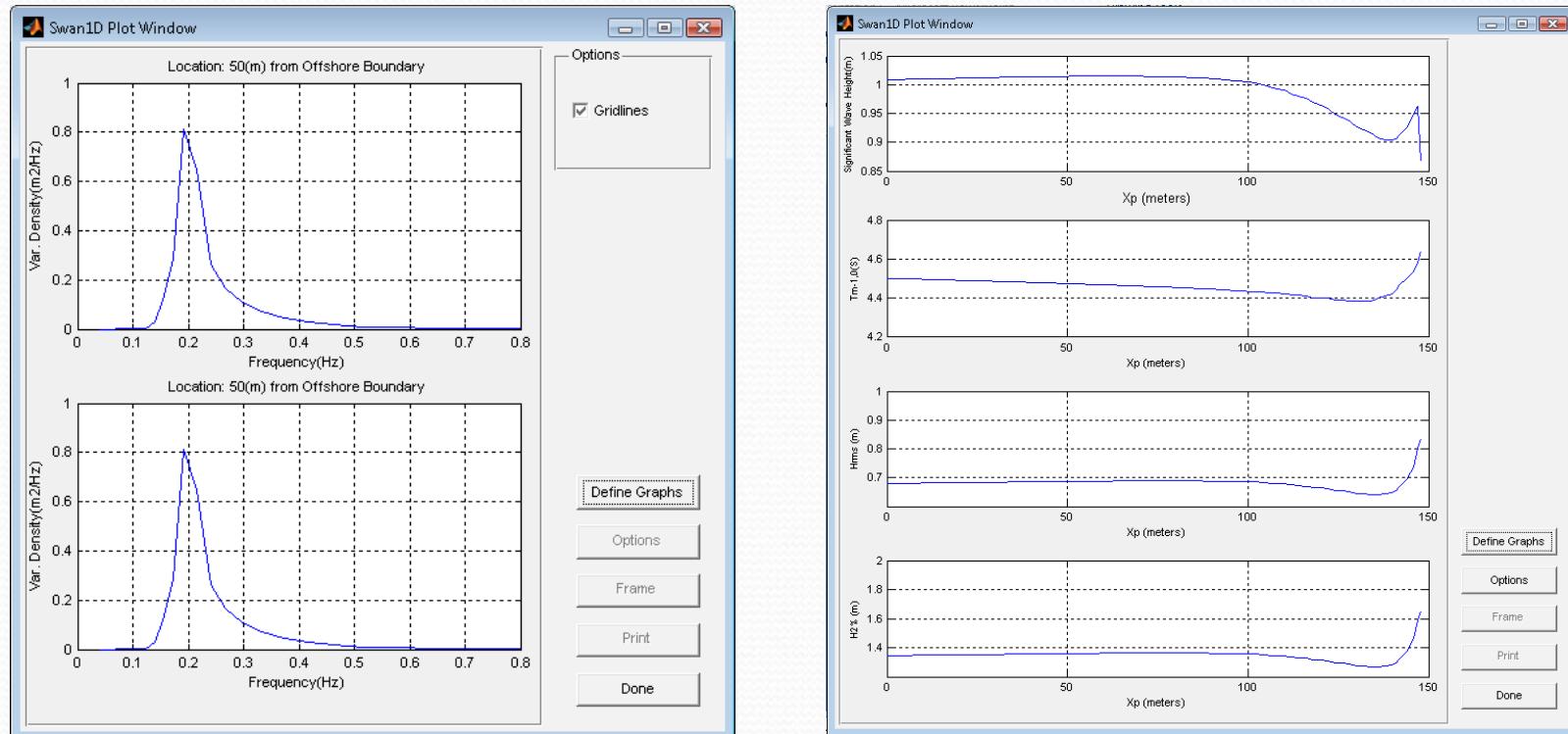
- ProjectName.MAT  
*“Data for the Interface”*
- ProjectName\_bot.DAT  
*“SWAN readable bottom profile”*
- ProjectName\_U.DAT  
*“SWAN readable Current Profile”*
- ProjectName.SWN  
*“List of Commands for SWAN”*
- ProjectName\_Table.TAB  
*“Output Table (Optional)”*

## What SWAN Creates:

- ProjectName.PRT  
*“A report on SWAN computation Process”*
- ProjectName.TAB  
*“SWAN output results”*
- ProjectName.SP1  
*“1-D Spectrum for output locations”*
- ProjectName.SP2  
*“2-D Spectrum for output locations”*

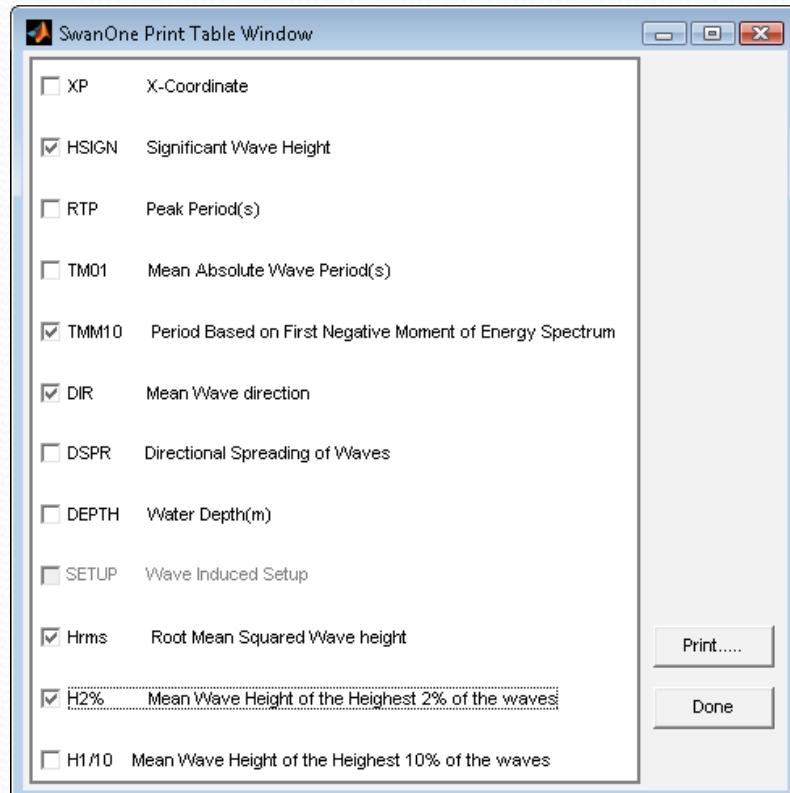
# Output

- Different Wave Variables along bottom profile, and wave spectrum at pre-defined output locations can be plotted and compared.



# Output

- The results can be printed in a table as a text file (ProjectName\_Table.TAB), and can be further loaded in MATLAB or Excel.



%	HSIGN(m)	TMM10(Sec)	DIR(Degr)	Hrms(m)	H2%(m)
1.0021200e+000	4.5097000e+000	2.3000000e-002	6.7799088e-001	1.3410660e+000	
1.0029900e+000	4.5056000e+000	2.4000000e-002	6.7862415e-001	1.3423186e+000	
1.0038800e+000	4.5014000e+000	2.4000000e-002	6.7927203e-001	1.3436001e+000	
1.0047900e+000	4.4970000e+000	2.4000000e-002	6.7993455e-001	1.3449105e+000	
1.0057300e+000	4.4926000e+000	2.5000000e-002	6.8061855e-001	1.3462635e+000	
1.0066800e+000	4.4879000e+000	2.5000000e-002	6.8131047e-001	1.3476321e+000	
1.0076600e+000	4.4832000e+000	2.6000000e-002	6.8202396e-001	1.3490434e+000	
1.0086700e+000	4.4782000e+000	2.7000000e-002	6.8275907e-001	1.3504974e+000	
1.0097100e+000	4.4731000e+000	2.8000000e-002	6.8351584e-001	1.3519943e+000	
1.0107700e+000	4.4679000e+000	2.9000000e-002	6.8428751e-001	1.3535207e+000	
1.0118500e+000	4.4625000e+000	3.0000000e-002	6.8507413e-001	1.3550766e+000	
1.0129600e+000	4.4569000e+000	3.2000000e-002	6.8588257e-001	1.3566757e+000	
1.0140300e+000	4.4517000e+000	3.4000000e-002	6.8666516e-001	1.3582337e+000	
1.0151000e+000	4.4465000e+000	3.8000000e-002	6.8744920e-001	1.3597745e+000	
1.0161100e+000	4.4417000e+000	4.4000000e-002	6.8819383e-001	1.3612474e+000	
1.0170800e+000	4.4372000e+000	4.8000000e-002	6.8891272e-001	1.3626694e+000	
1.0180400e+000	4.4329000e+000	5.1000000e-002	6.8962639e-001	1.3640810e+000	
1.0189700e+000	4.4288000e+000	5.6000000e-002	6.9032123e-001	1.3654554e+000	
1.0198500e+000	4.4249000e+000	5.9000000e-002	6.9098364e-001	1.3667656e+000	
1.0207300e+000	4.4211000e+000	6.2000000e-002	6.9164780e-001	1.3680794e+000	
1.0216100e+000	4.4172000e+000	6.5000000e-002	6.9231378e-001	1.3693967e+000	
1.0224700e+000	4.4135000e+000	6.9000000e-002	6.9296779e-001	1.3706907e+000	
1.0233100e+000	4.4099000e+000	7.3000000e-002	6.9361048e-001	1.3719615e+000	
1.0241300e+000	4.4065000e+000	7.5000000e-002	6.9424134e-001	1.3732094e+000	
1.0249300e+000	4.4031000e+000	7.6000000e-002	6.9486062e-001	1.3744343e+000	
1.0257100e+000	4.3998000e+000	7.7000000e-002	6.9546841e-001	1.3756335e+000	
1.0264700e+000	4.3967000e+000	7.8000000e-002	6.9606477e-001	1.3768161e+000	
1.0272300e+000	4.3935000e+000	8.2000000e-002	6.9666348e-001	1.3780004e+000	
1.0279600e+000	4.3905000e+000	8.6000000e-002	6.9724411e-001	1.3791489e+000	
1.0286600e+000	4.3877000e+000	8.8000000e-002	6.9780675e-001	1.3802617e+000	
1.0293600e+000	4.3849000e+000	8.9000000e-002	6.9837201e-001	1.3813798e+000	
1.0300400e+000	4.3821000e+000	9.1000000e-002	6.9892633e-001	1.3824763e+000	
1.0307200e+000	4.3793000e+000	9.3000000e-002	6.9948351e-001	1.3835784e+000	
1.0314100e+000	4.3765000e+000	9.5000000e-002	7.0005052e-001	1.3846999e+000	
1.0320800e+000	4.3736000e+000	9.6000000e-002	7.0060696e-001	1.3858006e+000	
1.0327500e+000	4.3707000e+000	9.8000000e-002	7.0116666e-001	1.3869077e+000	
1.0334300e+000	4.3678000e+000	9.8000000e-002	7.0173663e-001	1.3880351e+000	
1.0340800e+000	4.3648000e+000	1.0000000e-001	7.0228961e-001	1.3891289e+000	