Computer Simulation of Water Surface View

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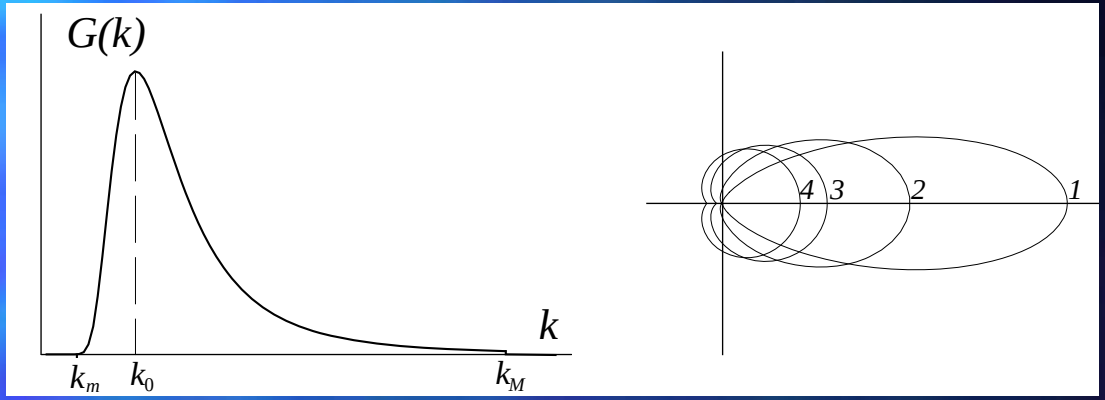
1. Sea swell simulation

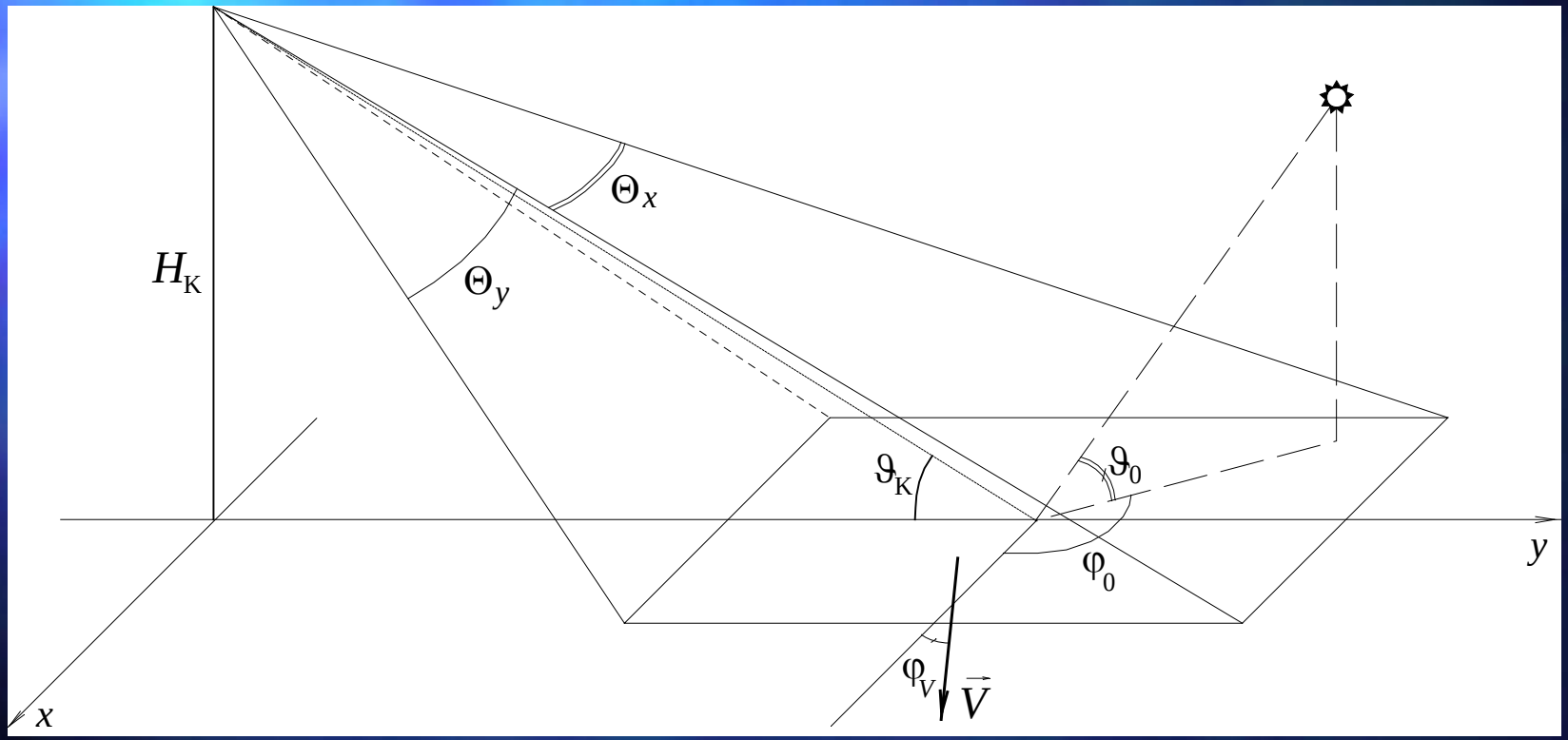


$$S(\mathbf{k}) = \int B(\boldsymbol{\rho}) e^{i\mathbf{k}\boldsymbol{\rho}} d^2\boldsymbol{\rho} = \int \langle \zeta(\mathbf{r}, t)\zeta(\mathbf{r}+\boldsymbol{\rho}, t)\rangle e^{i\mathbf{k}\boldsymbol{\rho}} d^2\boldsymbol{\rho}$$

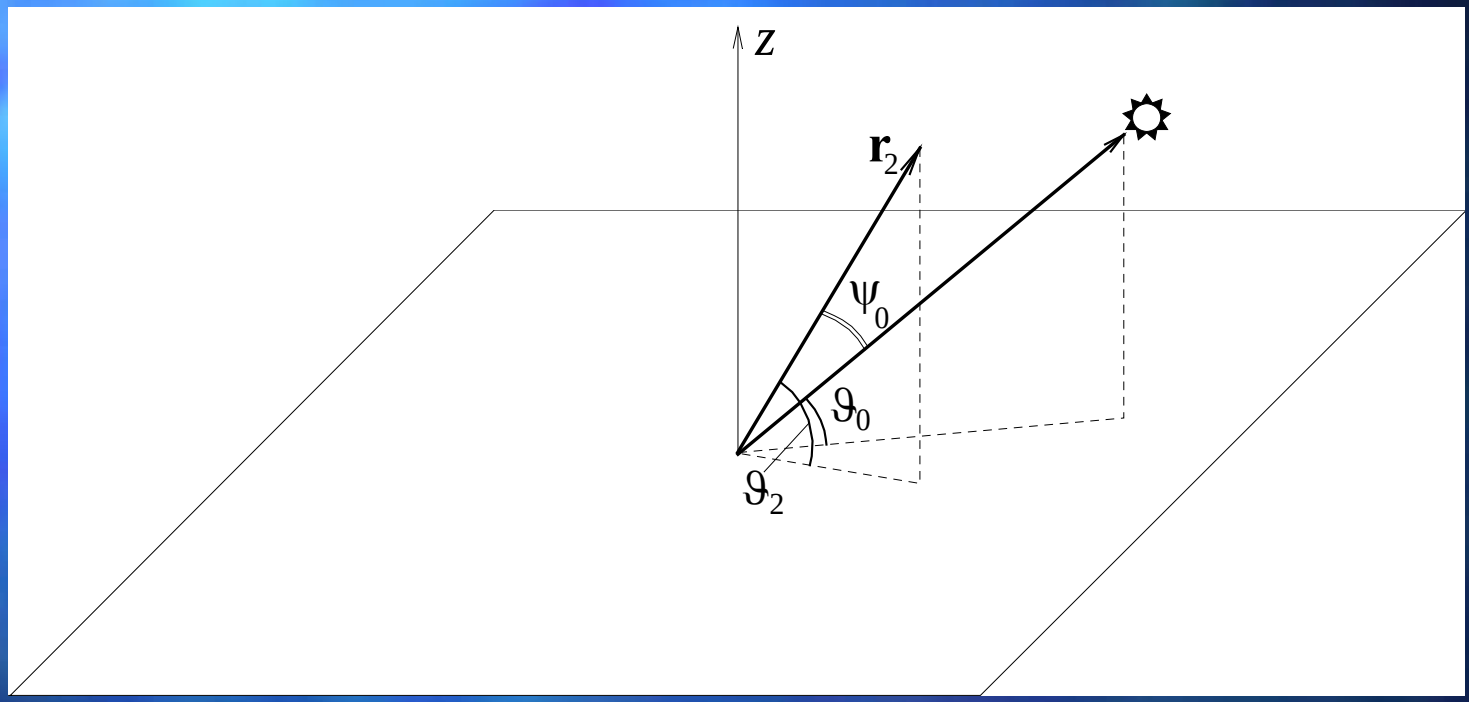
$$\zeta(x, y, t) = \sum_{l=1}^{N_k} \sum_{m=1}^{N_\varphi} A(k_l, \varphi_m)\cos[\omega(k_l)t - k_l x\cos\varphi_m - k_l y\sin\varphi_m + \Psi_{lm}]$$

$$A(k_l, \varphi_m) = \sqrt{2S(k_l, \varphi_m)k_l \Delta k_l \Delta\varphi_m}$$

2. Frame - horizontal plane coordinates recalculate



3. Spectral-angle distribution of sky brightness

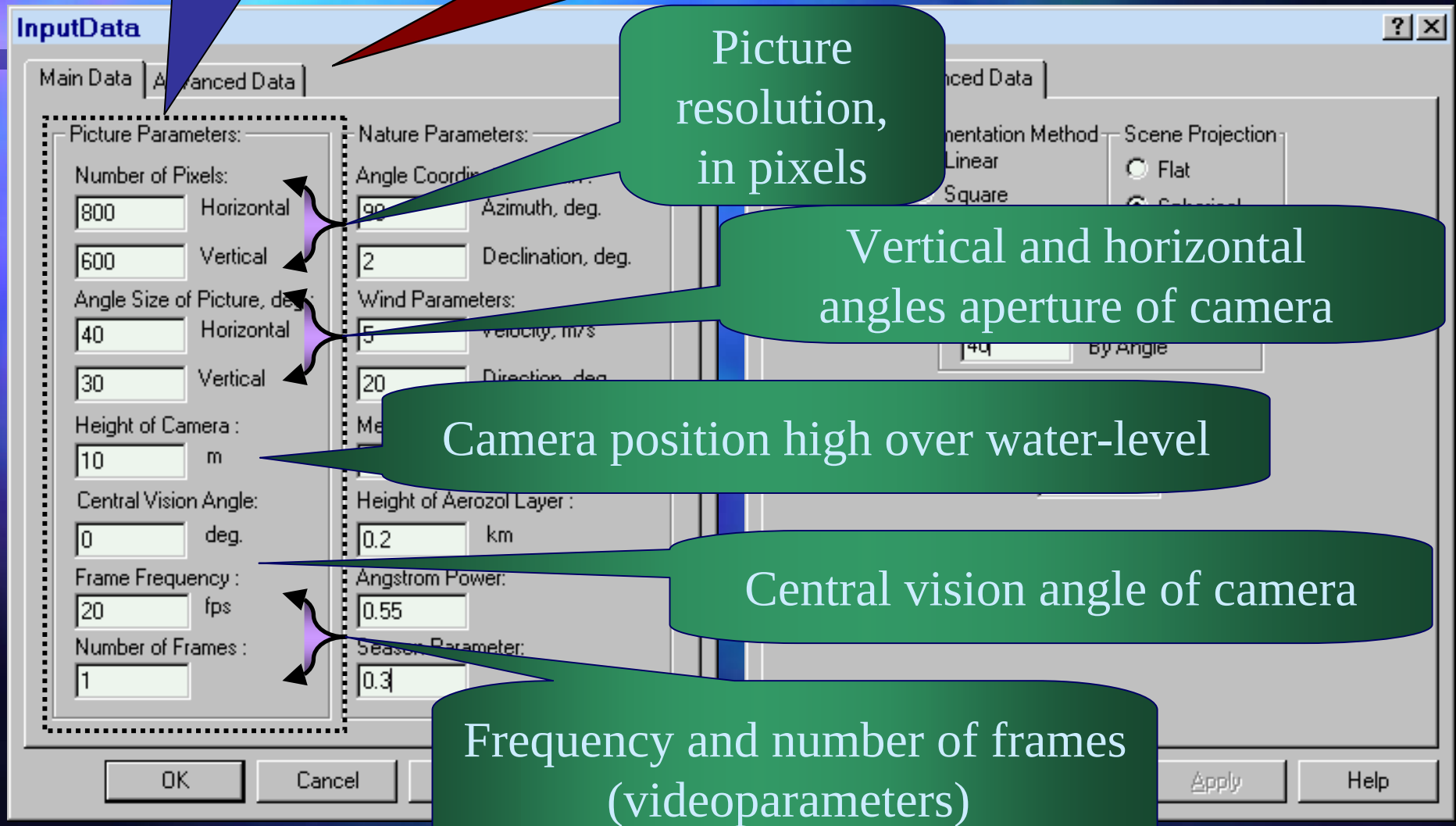


Spectral-angle distribution of sky brightness
is dependence between brightness of point on sky sphere and wavelength

Picture parameters

Main parameters

Parameters



Picture resolution, in pixels

Vertical and horizontal angles aperture of camera

Camera position high over water-level

Central vision angle of camera

Frequency and number of frames (videoparameters)

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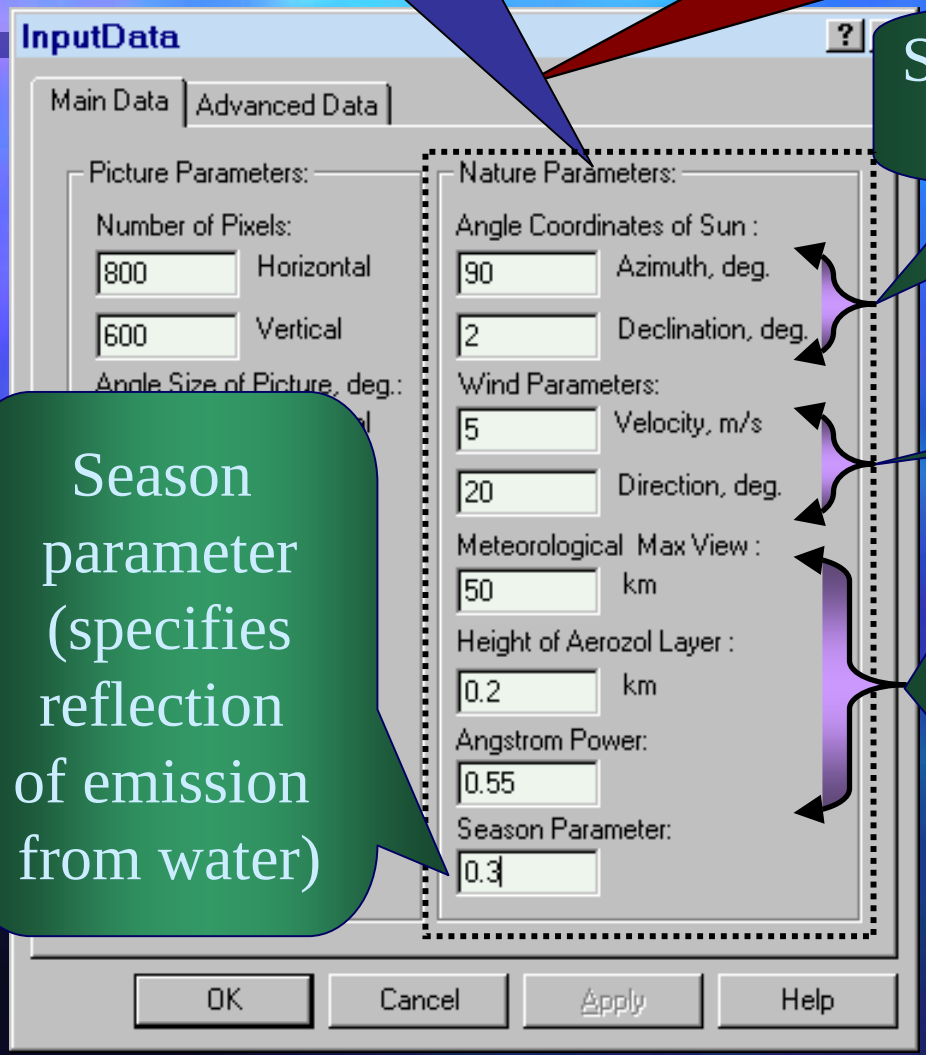
Nature Parameters

Main parameters



Spherical coordinates of sun

Wind velocity and direction

Season parameter (specifies reflection of emission from water)

Meteorological length of visibility, High of dissipation aerosol layer, Angstrem power, (specify aerosol dissipation)

Inpu

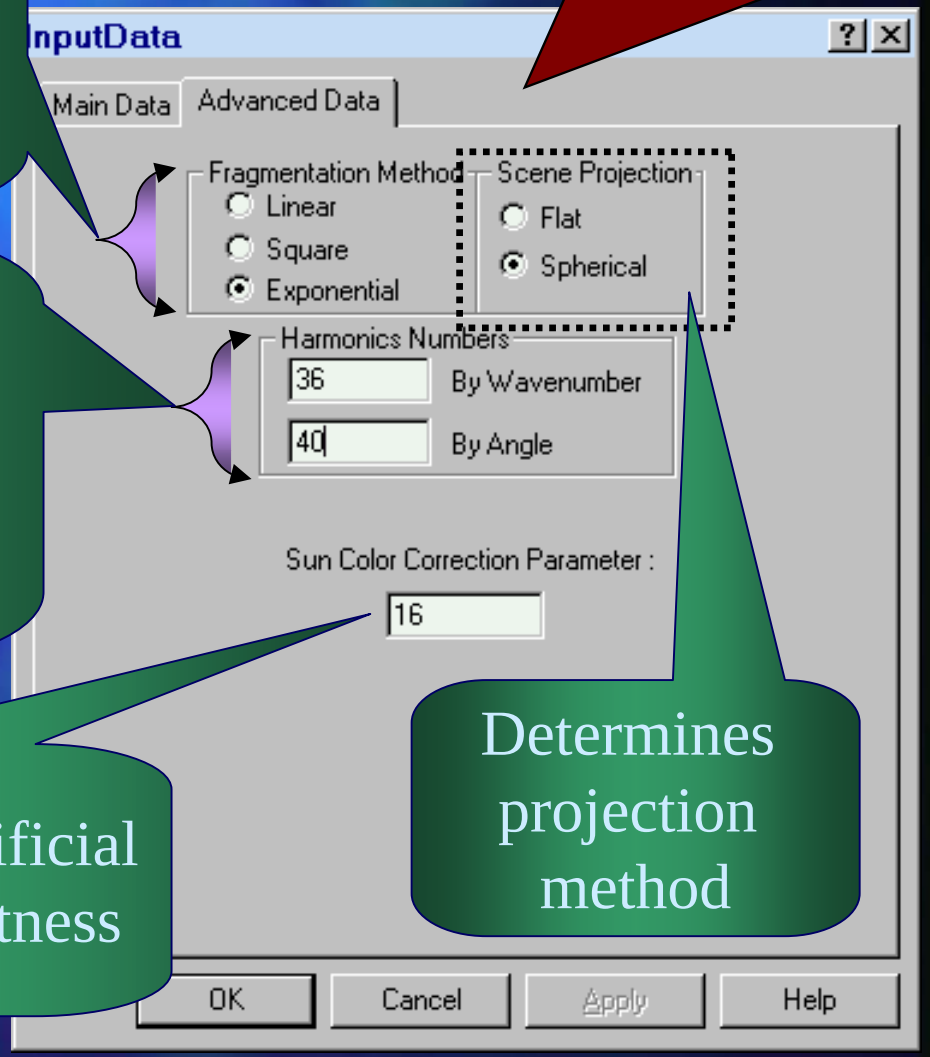
Advanced parameters

Specifies fragmentation method of interval of wave number : linear, square or exponential

Determines numbers of derivations of wave number and azimuth angle intervals (specifies quality of water surface representation)

Parameter regulating artificial increasing of sun brightness

Determines projection method

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Fiction art

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Some unheeded effects

Video samples