

命令模式

WAVE [(form)] phase [length [height [encounter]]]

Defines a periodic wave to be superimposed on the waterplane.

定义水面上一个周期波。

WAVE

Displays the current wave parameters.

显示波浪参数

参数说明

(form)

May be TROchoid, SINusoid, STOKes or OFF. If omitted, TROCHOID is assumed.

可以是 TROchoid(余摆波), SINusoid(正弦波), STOKes(Stok 波) 或 OFF, 缺省值代表余摆波。

phase

Phase angle in degrees: the location of the crest relative to the origin in the direction from which the waves are approaching.

相位角, 单位是度: 在波的来向方向, 波峰相对于原点位置。

length

Distance between crests in current length units. If omitted, the current LWL is used (see the LWL command).

当前单位下的波长。缺省值为船的水线间 LWL 长。

height

Vertical distance between the wave crest and trough in current length units. If omitted, 1/20th of the length is assumed.

波高: 在整个波长内波峰与波谷之间的垂直距离。缺省值为波长的 1/20。

encounter

Angle of encounter in degrees. Zero for following or overtaking sea, 90° for starboard beam sea, etc. If omitted, zero is assumed.

遭遇角, 单位是度。0 度代表迎浪或随浪, 90 度代表右舷横浪。缺省值为 0 度。

Notes:

说明:

The parameters must occur in the indicated order.

参数必须以指定顺序输入。

The COMPONENT /SECTIONS command is useful for verifying wave profiles.

可使用 COMPONENT /SECTIONS 命令来核对波浪形状。

Operation

操作

The waterplane defined by heel, trim and origin depth is the base plane on which the wave is constructed.

波浪是建立在固定的水平面上，该水平面通过横倾角度、纵倾角度和原点到水平面的垂直距离来定义。

Looking along a line in the direction of encounter: Crests occur at multiples of 360° from the phase angle, and troughs occur at $\pm 180^\circ$ from the crests. When the phase parameter is zero, a crest is directly above the origin (projected perpendicularly to the base plane). As the phase parameter increases from zero, the crest moves toward the direction of encounter (eg. toward the stern if encounter is zero).

根据遭遇角，沿着波的方向，波峰从初始相位角开始每 360° 循环一次。波谷在波峰的 $\pm 180^\circ$ 处。当参数 phase 相位为 0 时，原点上方处既是波峰（垂直投影到基准平面）。随着参数 phase 的增加，波峰根据遭遇角，顺着波的方向前移（例：波向船尾移动，如果遭遇角为 0° 时）。

Wave length should not be much smaller than the length of the vessel unless the vessel model is equipped with a suitably close section spacing. Otherwise, the "sampling" of the wave which takes place at the model's section locations, will not be dense enough (there should be at least eight samples per wave cycle).

波长对应于船长不能太小，除非船舶模型中横站的间距合适，否则波形在模型各站上的取样将不够密。（每个周期内，至少应有 8 个样本值。）

When the encounter angle is near the beam, the wave length should be at least four times the width of the vessel, since the wave profile is linearized as it crosses each section. In determining the wave elevation and angle at a given section, the longitudinal location of the section is used together with the transverse center of the extreme width of the component.

当波浪的遭遇角接近横浪时，波长要大于 4 倍的船宽，这是因为波浪在船舶的每站之间是线性插值的。在计算特定站上波浪的高度和角度时，根据该站的纵向位置和构部件在最大宽度处的形心横向位置计算得出。

Wave height must be less than $2/7$ (28.5%) of length (and should be less than 18% for Stokes waves to avoid unrealistic secondary humps).

波高必须小于 $2/7$ (28.5%)的波长(对于 Stoke 波，波高要小于 18%的波长以避免出现不真实的二次驼峰)。

The wave forms $y(x)$ are:

Trochoid: $y = 1/2H \cos a$

$$x = a/k - 1/2H \sin a$$

Sinusoid: $y = 1/2H \cos kx$

Stokes second order: $y = 1/2H (\cos kx + 1/2Hk \cos 2kx)$

where $k = 2\pi/\text{length}$; $H = \text{height}$

波形 $y(x)$ 如下:

Trochoid:	$y = 1/2H \cos a$
	$x = a/k - 1/2H \sin a$
Sinusoid:	$y = 1/2H \cos kx$
Stokes second order:	$y = 1/2H (\cos kx + 1/2Hk \cos 2kx)$

其中 $k = 2\pi/\text{length}$; $H = \text{height}$

WAVE OFF (or setting the height to zero) can be used to "turn off" the wave, reverting to the flat waterplane.

WAVE OFF 命令 (或者将波长设置为 0) 可以关闭浪, 使得水面恢复到水平面。

Display Output

显示输出

Issued with or without parameters, the WAVE command displays - on both screen and current output device - a description of the wave in effect. (When the WAVE command is given without parameters, only the display occurs; no changes are made to the wave.)

当 WAVE 命令使用时, 波的描述将在屏幕中显示, 同时也在输出文件中显示。(WAVE 命令后无参数, 则仅在屏幕显示, 且不会改变波浪设置)

Measures of the wave profile as it is encountered at each section of the vessel model are available via the COMPONENT command with the /SECTIONS parameter.

量取波浪在沿船长方向每站分布的形状, 可以通过 COMPONENT 命令与参数/SECTIONS 来实现。

Nondisplay Output:

不显示结果:

none.

无

Examples

样例

A trochoidal wave cresting at the origin, 105 length units between crests using default height of length/20:

定义余摆波, 波峰位于原点, 波长 105 米, 波高为波长的 1/20。

WAVE 0 105

A trough-at-origin stokes wave, 10.5 high using the default length (LWL):

定义 Stoke 波，波谷位于原点，波长等于水线间长，波高为 10.5 米。

WAVE(STOKES) 180,,10.5

A 200 x 15 sine wave coming from 2 the starboard beam, crest 100 length units to stbd:

根据当前长度单位，定义正弦波，右舷横浪，波峰距离右舷 100，波长 200，波高为 15。

WAVE(SIN) 180, 200, 15, 90