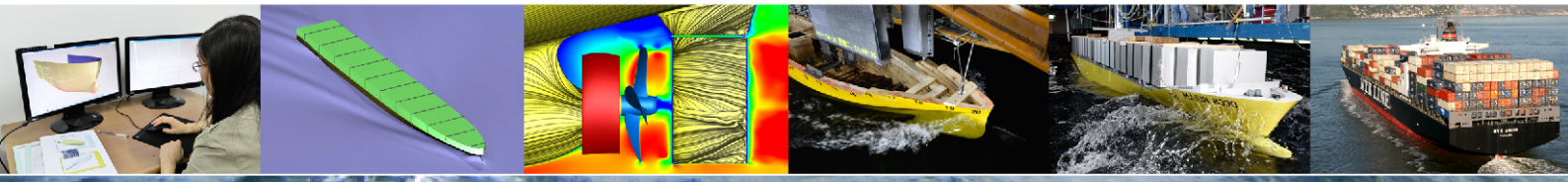

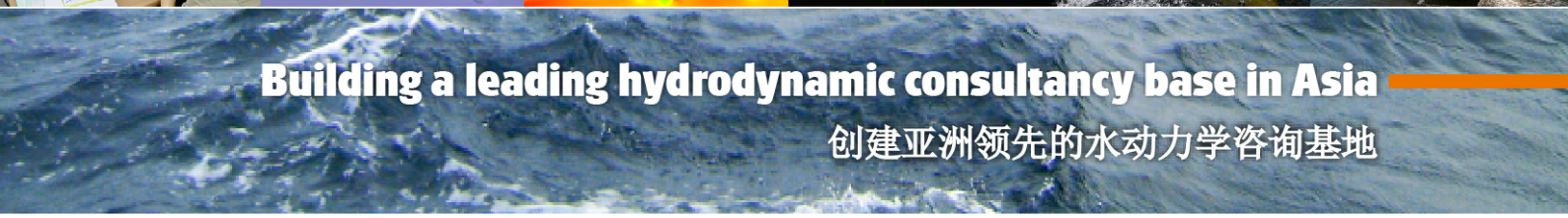

3-D potential theory including wave diffraction 三维势流理论包含波浪绕射

DIFFRAC

DIFFRAC is a wave diffraction program capable of calculating the wave loads and motion responses of free floating or moored structures in regular waves, including their hydrodynamic interaction. The program is applicable to both shallow and deep water and has been validated against many physical model test results.

DIFFRAC 是一款波浪绕射程序，能够计算波浪载荷和自由浮动或者系泊结构在规则波中的运动响应，包括它们之间的水动力干扰。该程序同时适用于浅水和深水，且被多个物理模型试验结果所验证。

Computational approach 计算方法

DIFFRAC is based on a three-dimensional source distribution technique for the solution of the linearised velocity potential problem. For this approach the fluid is assumed to be inviscid, homogeneous, irrotational and incompressible. DIFFRAC computes fluid pressures and wave loads on the basis of the velocity potential around the vessel(s), given as a scalar function in space and time.

DIFFRAC 是基于三维源分布技术解决线性化速度势问题。该方法假定流体是无粘性的、均匀的、无旋且不可压缩的。**DIFFRAC** 基于船体周围的速度势和给定的一个在空间和时间上的标量函数计算流体的压力和波浪载荷。

For the computations, the mean wetted part of the hull of the vessel(s) is approximated by a number of plane elements. Each element represents a distribution of source singularities, each of which contributes to the velocity potential describing the fluid flow.

为了便于计算，船体湿面积是由多个面元素近似求解的。每一个元素代表一种源汇分布，从而有助于描述流体的速度势。

The rigid lid method is used to suppress the effect of irregular frequencies. A damping lid may be used to damp resonant water motions, for example in the gap between side-by-side moored vessels.

使用刚盖假定法抑制不规则频率的影响。阻尼盖可用于控制自由液面共振运动，例如并排停泊船只之间的间歇。

Input 输入

- **Structure's geometry (body plan)**
- **Position of centre of gravity**
- **Radii of inertia about the three axes**
- **Water depth**
- 几何结构（横剖面图）
- 重心位置
- 三轴惯性半径
- 水深

Output 输出

- **Hydrodynamic reaction forces and moments, expressed as added mass and damping coefficients due to the structure-fluid interaction**
- **First order wave exciting forces and moments including the diffraction effects of the waves on the structure(s)**
- **Response amplitude and phase operators can be obtained from the linearised set of equations of motion, where the first-order wave exciting forces and moments together with the added mass and damping coefficients are used**
- **Total pressure distribution, including motion and wave effects, needed for the strength analysis (DYNFORC)**

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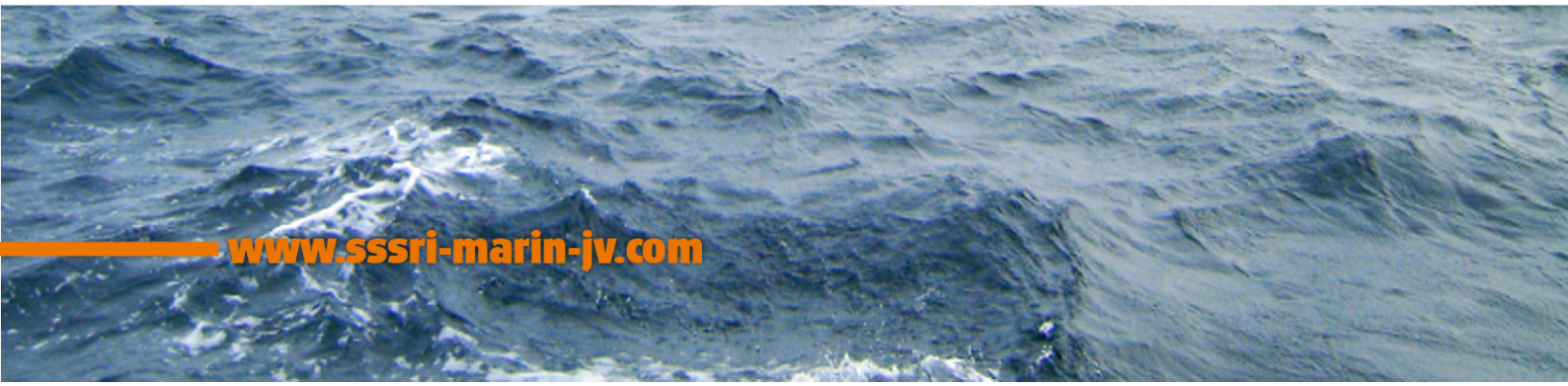
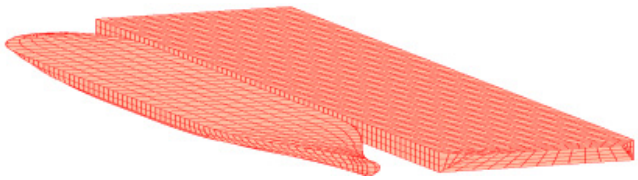


- **Water velocities needed for drift force analysis (DRIFTP/DBDRIFT)**
- 流体反作用力和力矩，以表示由于流体-结构耦合产生的附加质量和阻尼系数
- 一阶波激振力和力矩，包括波浪对结构的绕射效应
- 幅频响应和相频响应，操作者可从一组线性化运动方程中获得，其中一阶波激振力和力矩以及附加质量和阻尼系数均可使用
- 总的压力分布，包括运动和波浪效应，所需的强度分析（**DYNFORC**）
- 漂移力分析所需的水流速度（**DRIFTP/DBDRIFT**）



Panel distribution of an LNG carrier side-by-side to an FSRU

LNG 运输船和与之并排的 **FSRU** 之间的网格分布

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