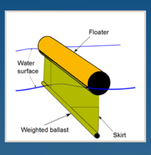
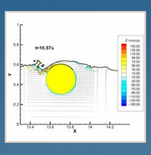
Oil-booms in waves

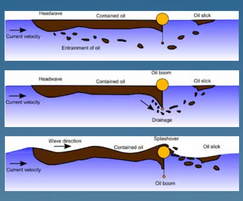
Oil booms are the most common tool for containing oil spill on water. Their performance in moderate waves and current is poor. The present study will investigate hydrodynamic aspects affecting the boom performance.





Basic oil boom construction consists of; **Flotation member** (floater), **membrane-like skirt**, **weighted ballast** (e.g. chain)

- **Limitations for operation of boom**
  - Maximum current speed is ca. 1 knot
  - Maximum wave height is ca. 3 meters
- **Factors that reduce the oil boom performance**
  - Entrainment from the oil headwave
  - Drainage due to hydrodynamic suction under the boom
  - Splash-over due to waves
  - Critical accumulation for heavy oils
  - Submergence or planing of the boom
- Our goal - **New knowledge on the loss mechanisms**
  - Improved design and better performance of oil booms
- **Develop a simulation program for oil booms in waves**
  - Viscous multiphase flow with free surface
  - Oil boom consisting of floater with flexible skirt and weighted ballast
  - Oil properties are static during simulation
  - Loss mechanisms will be investigated



Loss due to entrainment of oil from headwave

Drainage failure due to hydrodynamic suction under the boom

Splash-over. Oil splashing over the boom due to waves

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