Geophysical Research Abstracts
Vol. 13, EGU2011-10784, 2011
EGU General Assembly 2011

Laboratory Modeling of Spiral Arms in Oil Spills

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The oil spills are the factor of risk in environmental systems. The transformation of oil patches on the water surface into the spiral arms is studied in the laboratory experiments with the compound vortex in the cylindrical container. The flow is produced by disk rotating at the bottom of the cylindrical container partly filled with water. The oil patches of various volumes are injected on the free surface of a quiescent fluid then the fluid is put into the complex vortex motion. The oil patch partly gathers in compact volume at the bottom of a surface trough and the left part forms spiral arms on the free surface. At low frequencies of disk rotation an interface air-liquid insignificantly differs from flat. The process of spiral arms formation starts with the start of disk rotation and the whole free surface is covered with small drops of oil and spiral arms attached to the main oil volume. Flow patterns are compared with environmental observations.