

FUTUREWAVESTM

WAVE AND VESSEL MOTION FORECASTING SYSTEM

BREAKTHROUGH CAPABILITIES IN REMOTE WAVE SENSING AND REAL-TIME SHIP-MOTION FORECASTING

DETAILED SEA-STATE INFORMATION IN VESSEL VICINITY
NO LONGER RELYING SOLELY ON EYE-SIGHT
NO NEED TO DEPLOY A BUOY
SELF-CALIBRATING

Wave
Radar

Wave
Radar

Motion
Sensor

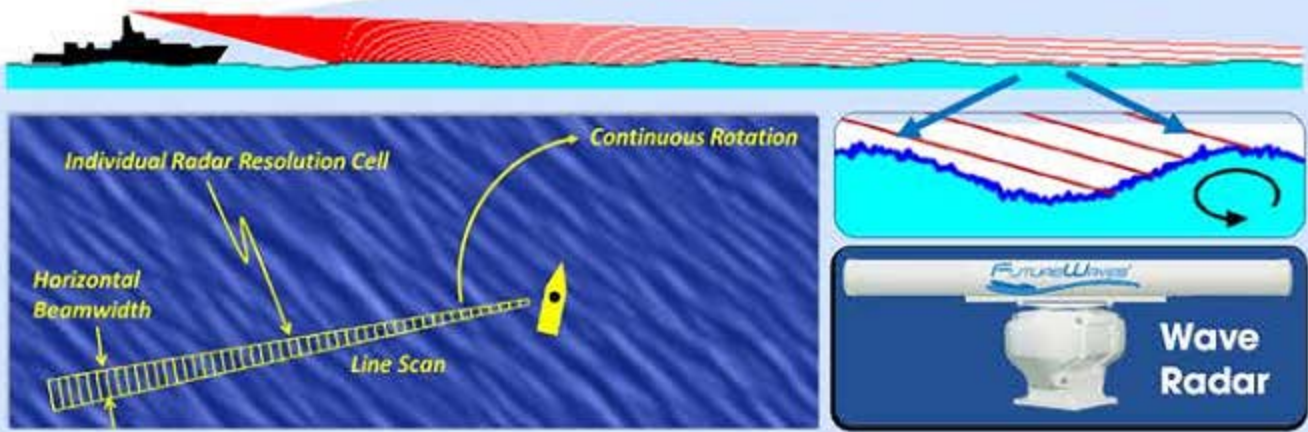
Processing
& Display

Real-time detailed wave characterization
Precise-timing of waves along the vessel track
Precise deck-motions for minutes into the future
Optimum course/speed to minimize motions
Queuing of upcoming quiescent periods
Warning of imminent excessive motions

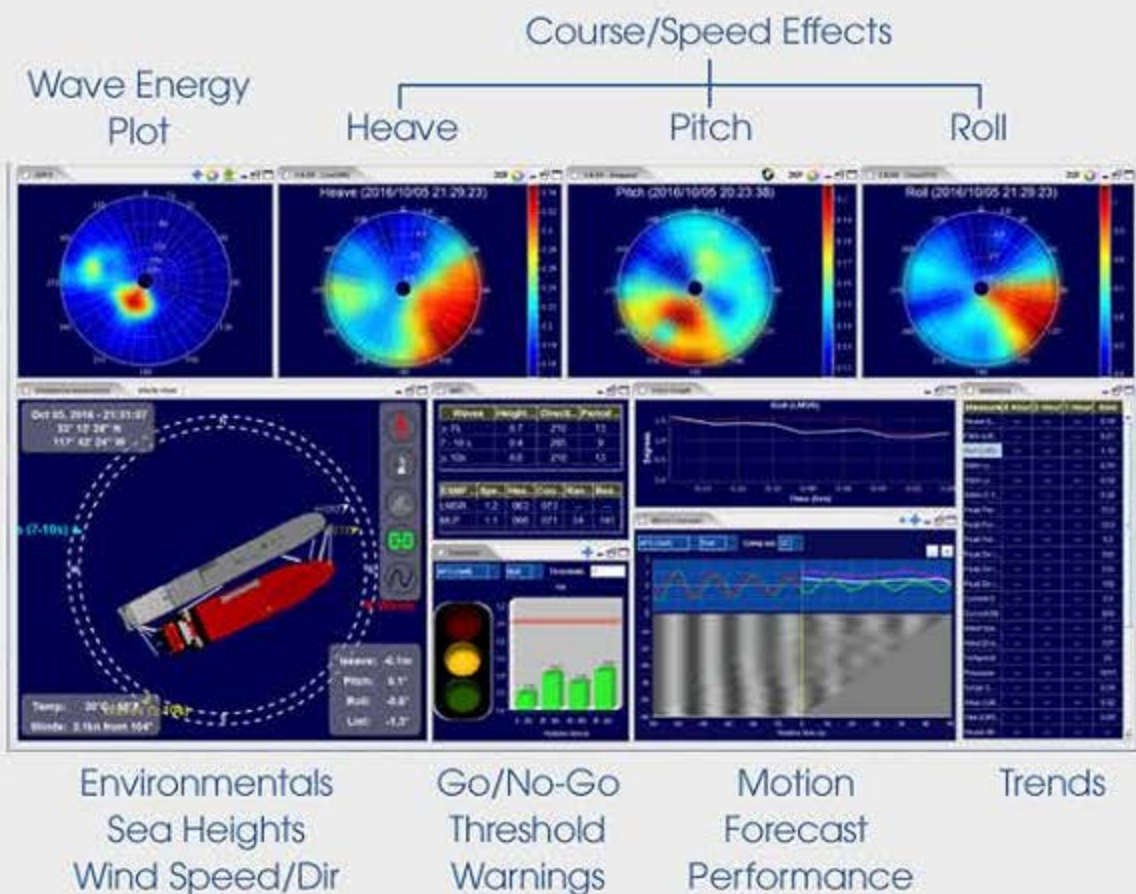


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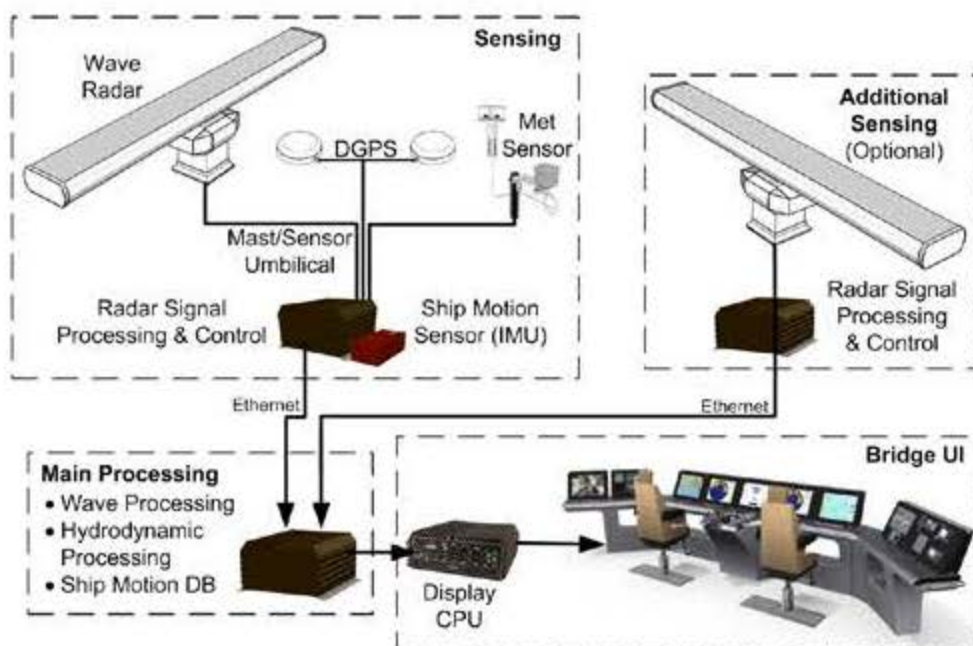
How It Works:



- Dedicated wave-radars (modified X-band) sense the wave field which is computationally 'decomposed' into spectral solution space
- Multiple wave-spectral (period and frequency) amplitudes are used to forecast and synthesize incident waves along the ship's track
- Wave info is passed onto a real-time ship-motion forecaster which uses a Reduced-Order Lump-Parameter Model to provide detailed deck motions for minutes into the future
- Adaptive modeling techniques mitigate model and real-world inaccuracies and continually improve forecast performance



Extends Workability and Enhances Safety



System Architecture Highlights:

- Real-Time Radar Signal Processing
- Real-Time Ship Motion Forecasts
- Open Source Gravity Middleware
- Fiber Ethernet Backbone
- Data Logging and Trend Analysis



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GENERAL DYNAMICS

Applied Physical Sciences

Founded in 2002, APS is a maritime technologies research & development company which was acquired by General Dynamics Corp as a subsidiary in 2012. Our expertise and core capabilities include:

- Sensing Systems
- Signal & Information Processing
- Ocean Engineering & Hydrodynamics
- Communications & Navigation
- Signatures and Platform Self-Noise
- Structural Mechanics
- Electromagnetic Machinery & Devices
- Integrated Software Architecture
- Rapid Prototyping & Production

APS Locations and Principal Customers



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