



LEONARDO CANADA - ELECTRONICS

Newton™

ELECTRONIC
WARFARE MODELLING
AND SIMULATION



NEWTON™ - ELECTRONIC WARFARE MODELING AND SIMULATION

Newton-Electronic Warfare (EW) Modeling and Simulation (M&S) tools for air, land and naval engagements between platforms equipped with integrated defensive aid suites, combat management or self-protection suites defending against multiple multi-mode threats.

Leonardo is a global leader in Electronic Attack, Electronic Protection and Electronic Support tools and technologies used globally in support of operations, research, training, tactics development, product assessment and platform configuration.

Newton is a powerful multi-domain physics-based modelling and simulation framework. Newton models Electronic Attack, Protection and Support equipment enabling users to evaluate and assess both attack and protection measures and how they can be utilised during an engagement with a kinetic effector (aka gun or missile). Newton is designed for:

- EWOS and Integrated Reprogramming Centers
- Development of sovereign countermeasures (CM) expertise
- EW Education and Training
- Development of effective self-protection tactics for improved survivability
- Evaluating the effectiveness of EW systems
- Software-In-The-Loop (SWIL) Simulations
- OT & E support
- C-UAS threat assessment and planning tool
- Communications and Datalink modelling
- Reproducing EW theatre phenomena
- Operator Training in ESM, ECM, ECCM, or RWR systems
- Training in all aspects of EW involving Electronic Protection (EP), Electronic Attack (EA), Electronic Support (ES), avoidance, targeting and any tactical employment of forces involving EW

Newton (Model)

Threat System Behaviour											
Artillery	Multi-Mode Guidance							Platform			
Anti-Aircraft	Missile					Radar			Air	Land	Naval
	Command Guided		Home Seeking			EASA	Multi-mode	Track While Scan			
	CG	SACLOS	Active	Semi-Active		Passive					
			APD	SA	TVM	IR	IIR				



The Leonardo Newton product, supported with our EW consultancy and training courses enables users to effectively develop, assess and sustain countermeasures, counter-countermeasures and tactics.

Newton enables users to model and evaluate complicated coordinated countermeasure systems, and the rules they have been programmed with, modelling all permutation of sequencing and interdependencies conceivable when defining time and/or event-based triggers for both onboard and offboard RF ECMs (including chaff, towed decoys, Expendable Active Decoys, Propelled EADs and DRFM-based self-protection jammers used to defend a platform from incoming threats.

Similarly, IR engagements and multi-mode RF/IR engagements between target platforms and IR and/or RF/IR guided air, surface or land launched missiles are supported. These threat systems can operate through a wide range of navigation modes, spoofing, jamming techniques and environmental factors. The IR CMs include MTV, Spec, Aero, Propelled and SMD flares as well as Lamp and Laser DIRCM systems.



Newton simulates all phases of an engagement; Target acquisition and tracking, missile/weapon launch, CM deployment and end-game intercept. Newton assists in developing and validating optimum countermeasures and tactics and maximises survivability in theater.

It is an indispensable tool for EW Subject Matter Experts, Research Scientists, Platform Operators and Strategic/Tactical Commanders to improve system performance and operational success. Scenarios can be populated with sovereign platform and sensor databases, threat databases or manually created and new entities saved/added.

ed Behaviour)

Platform Behaviour											
Self Protection Management System						Platforms					
Countermeasures						Sensors		Tactics	Air	Land	Naval
Onboard			Offboard				MAWS	RWR	Maneuvers/Auto-MDL		
Soft/Hard Kill	IP Jammer	RF Jammer	Chaff/Flare/Reflector	Expendable Active Decoy (RF)	Towed Decoy (RF & IR)	Obscurant					



BUILT FOR THE FUTURE BATTLESPACE

Newton is designed to support a comprehensive technology roadmap. The following capability is evolving or planned for future releases:

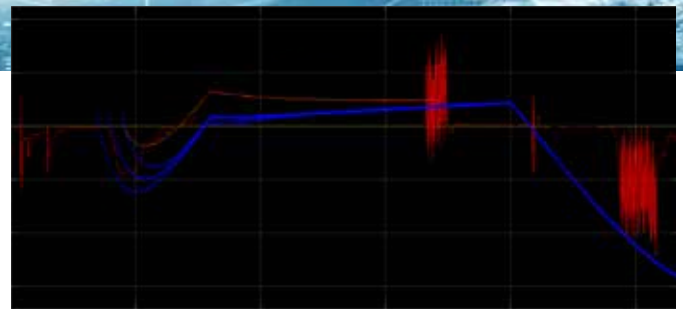
- Many-on-Many Scenario Modelling where the model will be scalable to meet complex mission and multiple mission scenarios
- Multi-Domain Modelling within a single scenario
- Scalable modelling fidelity to meet run time needs of the user
- EW Situational Awareness and provision for EW Situational Awareness (SA) for C2-C4 use cases and predictive modelling based on the current SA
- Real-Time modelling for Hardware-In-The-Loop (HWIL) applications
- Advanced Hypersonic Weapon engagements
- Development engine for Artificial Intelligence (AI) and Machine Learning (ML) Algorithm Research and Development (R&D)

Calculated Measures of Effectiveness include the miss distance, probability of kill and probability of survival. Detailed scopes and analysis windows allow users to analyze, design, evaluate, understand, optimize, and validate countermeasures against radar and infrared guided weapons through a comprehensive engagement scenario simulation in single, multi-run or Monte Carlo modes.

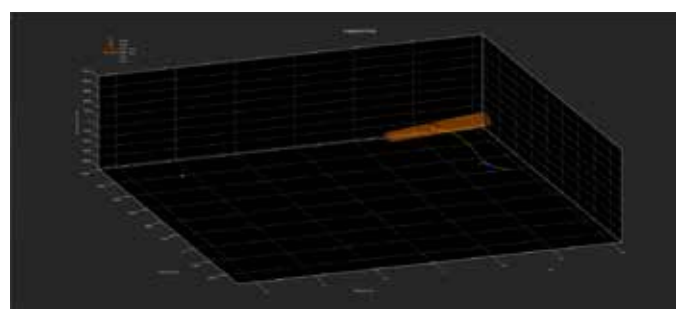
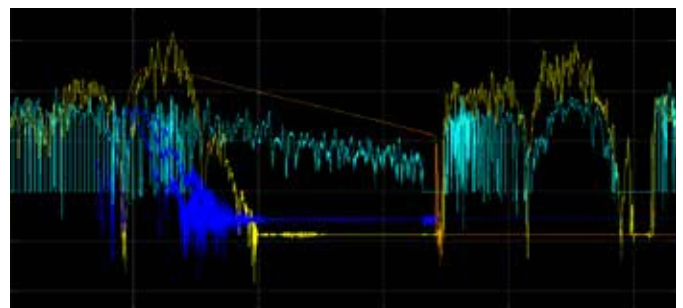
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Sample EO/IR Sensor Parameter Graphs



Sample Radar Parameter Graphs

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