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Integrated Air and Missile Defence under Spatial Grasp Technology

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A novel control technology for solving tasks in large distributed networked systems will be briefed. Based on active scenarios self-navigating and matching distributed systems in highly organized super-virus mode, it can effectively establish global control over large systems of any natures. It can use numerous scattered and dissimilar facilities in an integral and holistic way allowing them to work together in a goal-driven supercomputer mode. This Spatial Grasp Technology (SGT) can be useful for air and missile defence in a variety of ways. For European missile defence, providing flexible C2 allowing us to grasp many incoming missiles in parallel and lead every missile individually through such stages as their infrared satellite pick up, relaying to sensors and weapons, supporting missile tracking by long-range sensors, and choosing upper or lower-layer available shooters. Due to moving intelligent scenarios not connected in advance to particular physical resources, the system can work after indiscriminate failures of any system components with their self-recovery or runtime substitution without losing the overall functionality. SGT can effectively withstand cruise missiles using highly organized distributed sensor network, where individual sensors may be cheap, ground or low-flying, in contrast to the existing expensive high-altitude planes, drones and aerostats, or casual top mountain solutions. Multiple cruise missiles can be grasped by individual mobile intelligence following their physical move electronically via sensor network, not allowing them to escape despite tricky routes, due to holistic sensor network organization behaving as an integral spatial brain covering any area. Another scenarios will be dealing with collective behavior of unmanned vehicles including situation where highly organizes swarm of UAVs operating in SGT is successfully fighting another manned, unmanned, or mixed swarm fully autonomously and without external control, also effective use of Directed Energy Weapons in space with the use of relay mirrors. The technology has been prototyped in different countries and tested in many areas including Distributed Interactive Simulation of battlefields being part of DIS project headquartered in Florida. The latest version can be installed on an agreement in a short time and on any platform needed.

P. Sapaty, “High-level Organization and Management of Directed Energy Systems”, Directed Energy Weapons, London, 2010.

‘____’, “Air & Missile Defense with Spatial Grasp Technology”, Unmanned Systems Asia, Workshop B, Singapore 2011.

‘____’, “High-Level Management of Distributed Air and Missile Defence Systems”, Air and Missile Defence India, New Delhi, 2012.

‘____’, “Distributed Air & Missile Defense with Spatial Grasp Technology”, ICA, Vol.3, No.2, 2012.

‘____’, “Providing Over-operability of Advanced ISR Systems by a High-Level Networking Technology”, Airborne ISR, London, 2015.

‘____’, “Military Robotics: Latest Trends and Spatial Grasp Solutions”, IJARAI, Vol. 4, No.4, 2015.

‘____’, “Distributed Missile Defence with Spatial Grasp Technology”, Military Space, London, 2015.

‘____’, Managing Distributed Dynamic Systems with Spatial Grasp Technology, Springer, 2017.