## CLAIMS

1. A system comprising:

a device (800) for protecting an aircraft against missiles,

and an external laser emitter (807) that is located externally to said device (800) yet in proximity to said device (800) and is operably communicating with said device (800);

the device (800) comprising:

(a) a Short-Wave InfraRed based, SWIR-based, Missile Tracking Unit (801), which comprises:

a SWIR-based optical imager (802) and an optical SWIR band filter (803),

the SWIR-based optical imager (802) being functionally associated with the optical SWIR band filter (803),

wherein the optical SWIR band filter (803) is configured to filter-in only optical signals having wavelengths in a range of 1,400 to 3,000 nanometers;

wherein the SWIR-based optical imager (802) is configured to capture only SWIR optical signals from an area surrounding the aircraft;

(b) a SWIR signals processor (804), configured:

to perform an analysis of the SWIR optical signals captured by the SWIR-based optical imager (802),

and to perform, based on said analysis,

(b1) a SWIR-based missile acquisition process, which is also based on raw angular position data of a missile as received from a Missile Approach Warning System of the aircraft, wherein the SWIR-based missile acquisition process generates an initial missile tracking data that is based on said raw angular position data of the missile;

and then,

(b2) a SWIR-based missile tracking process, which continuously and dynamically determines a precise angular position of the missile based on the SWIR optical signals captured by the SWIR-based optical imager (802);

(c) a laser-based missile-jamming unit (805), which comprises at least one of:

(c1) an internal laser emitter (806) that is located integrally within said device (800) and is co-located with said SWIR-based Missile Tracking Unit (801), and/or (c2) a fiber optic interface for said external laser emitter (807);

wherein the laser-based missile-jamming unit (805) is configured to emit a missile-jamming laser beam, towards said missile, based on a signal received from the SWIR signals processor (804),

wherein said signal indicates the precise angular position of said missile;

wherein at least a portion of an internal optical path (809) utilized by the SWIR-based optical imager (802) for reception of SWIR optical signals, is also concurrently utilized by the laser-based missile-jamming unit (805) for transmission of the missile-jamming laser beam;

characterized in that,

wherein the device (800) comprises:

a MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830), to perform a classification of said missile as either an Anti-Tank missile or as a MANPAD missile, based on optical signals captured by the SWIR-based optical imager (802) and processed by the SWIR signals processor (804),

wherein the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) excludes any Radar mechanism, and is configured to perform said classification of said missile exclusively based on SWIR-based optical signals and not based on radar signals,

based on, cumulatively, (i) extraction of a flight velocity of said missile via optical analysis of the optical signals captured by the SWIR-based optical imager (802), and also (ii) optical analysis of backscattered optical signals that are backscattered from said missile in response to laser emissions from said device (800) towards said missile, and also (iii) extraction of a self-rotation frequency of said missile based on optical analysis of SWIR-based signals received by the SWIR-based optical imager (802);

and if said flight velocity of the missile is greater than a threshold value (V1), then classifying said missile as a MANPAD missile, and triggering a first set of laser-based jamming operations towards the MANPAD missile,

and conversely, if said flight velocity of the missile is equal to or smaller than said threshold value (V1), then classifying said missile as an Anti-Tank missile, and triggering a second, different, set of laser-based jamming operations towards the Anti-Tank missile.

2. The system according to claim 1,

wherein the device (800) further comprises:

a Beam-Riding Anti-Tank Guided Missile / Non-Beam-Riding Anti-Tank Guided Missile classifier unit (828),

configured to perform analysis of SWIR optical signals that are received at the SWIR-based Missile Tracking Unit (801), and based on said analysis, to generate a classification signal indicating whether said missile is either a Laser-Beam Riding Anti-Tank Guided Missile or a non-laser-beam-riding Anti-Tank Guided Missile;

wherein, based on said classification signal, the laser-based missile-jamming unit (805) determines whether to perform (I) laser-based jamming of said missile, or (II) laser-based jamming of a control station that controls said missile via a laser guidance beam.

3. The system according to claim 2,

wherein said Beam-Riding Anti-Tank Guided Missile / Non-Beam-Riding Anti-Tank Guided Missile classifier unit (828) is configured to generate a determination that said missile is a Laser-Beam Riding Anti-Tank Guided Missile based on said analysis of SWIR optical signals;

and wherein based on said determination, an optical fiber interface (829) of said device (800) transports an indication of the precise angular position of the missile, to said external high-power laser emitter (807), which in turn is configured to emit a high-power laser beam towards said missile which was determined to be a Laser-Beam Riding Anti-Tank Guided Missile.

4. The system according to claim 1,

wherein the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) is further configured to classify said missile, specifically, as either (I) an Anti-Tank Guided Missile that is beam riding, or as (II) an Anti-Tank missile that is non beam riding;

and if the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) has classified said missile as an Anti-Tank Guided Missile that is beam riding, then: locating a guidance station that guides said missile in flight via a guiding laser beam, and triggering a first set of laser-based jamming operations towards said guiding station to indirectly disrupt said missile,

and conversely, if the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) has classified said missile as an Anti-Tank missile that is non beam riding, then: triggering a second, different, set of laser-based jamming
operations that are emitted directly towards said missile to directly disrupt said missile.

5. The system according to claim 1,

wherein the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) is further configured to classify said missile, specifically, as either (i) a missile having Electronic Warfare capability, or (ii) a missile lacking Electronic Warfare capability;

if the missile was classified as having Electronic Warfare capability, then the laser-based missile-jamming unit (805) performs a first set of laser-based missile-jamming operations towards said missile;

if the missile was classified as lacking Electronic Warfare capability, then the laser-based missile-jamming unit (805) performs a second, different, set of laser-based missile-jamming operations towards said missile.

6. The system according to claim 1,

wherein the device (800) comprises:

a Laser-Based Jamming Configuration Unit (833), operable to selectively and dynamically configure the laser-based missile-jamming unit (805);

wherein, if the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) determines that said missile is a MANPAD missile, then the Laser-Based Jamming Configuration Unit (833) configures the laser-based missile-jamming unit (805) to emit laser beams that include at least one of:

a laser beam having an Ultra Violet wavelength,

a laser beam having a Short Wavelength Infrared wavelength,

a laser beam having a Medium Wavelength Infrared wavelength;

wherein, if the MANPAD Missile / Anti-Tank Missile Optical Classification Unit (830) determines that said missile is an Anti-Tank missile, then the Laser-Based Jamming Configuration Unit (833) configures the laser-based missile-jamming unit (805) to emit laser beams that include at least one of:

a laser beam having a Visible wavelength,

a laser beam having a Short Wavelength Infrared wavelength,

a laser beam having a Medium Wavelength Infrared wavelength,

a laser beam having a Near-Infrared wavelength,

a laser beam having a Long Wavelength Infrared wavelength.

7. A method for protecting an aircraft against missiles,

the method comprising:

connecting to said aircraft the system according to any one of claims 1-6.