Defence-related Research Action - DEFRA

ACRONYM: AQUILA

Title: Affordable Quick-reaction UAS Interception and Long-range Accuracy

Duration of the project: 01/12/2023 – 01/12/2026

Key words: UAS, C/UAV, reactive materials, proximity fuze, long-range

Budget: 1.544 k€

of which RHID contribution: 1.253 k€

PROJECT DESCRIPTION

The ongoing war in Ukraine has shown a massive use of drones and Area-Denial weapon systems: UAV and AD systems are versatile, efficient and hard to counter, thus granting a strategic upper hand to their users, even in the case of near-pear conflicts. There's a growing need for affordable, quick-reaction and effective UAV counters, and for weapons that outrange enemy systems. We hereby propose to study the use of new innovative and/or improved rocket systems to address emerging threats, and with improved range.

Project AQUILA aims at improving rocket systems, and at adapting them so that they can address emerging threats such as UAVs, while remaining extremely competitive when compared to more expensive solutions: missiles, HIMARS, GLSDB, …
We intend to do so within the framework of a multidisciplinary partnership project, with, on the industrial side:

- TBE as technical lead and rocket specialist
- Lambda-X as a partner with expertise in optical engineering

and, on the academia side:

- the RMA as research lead and ballistics specialist
- Materia Nova as a partner with expertise in combustible pressed and sintered metallic powders

Project AQUILA intends to reach the three following main research objectives:

1) Improve performances of rocket warheads against UAS targets. Existing rocket systems lack the lethal radius and the precision to address drone targets. Consequently, we hereby propose

to study three potential solutions to improve rocket system performances. The first potential solution we mean to study is the use of preformed steel fragments warheads. The second potential solution we mean to study is the use of preformed reactive fragments warheads. The third and last potential solution is to take benefit from the Semi-Active Laser (SAL) seeker head that was developed for the Laser Guided Rocket (LGR) to develop a low-cost and efficient proximity fuze against UAV targets.

2) Reduce the potential collateral damage of C-UAS preformed fragments rockets warheads. Project Aquila plans to achieve this objective achieved using combustible fragments. We plan to do so in the same way and with the same partners than the aforementioned reactive fragments study.

3) Improve rocket systems operational range. Project AQUILA intends to widen the use case of rocket systems even further by studying high-caliber & gliding rocket munition concepts, which should allow them to hit previously out-of-reach targets. In the scope of this project, we intend to evaluate numerically a large number of high-caliber and/or gliding rocket munition concepts.

All technological blocks will be investigated independently, each one being the object of its own work package.

The impacts of project AQUILA should lead to:

- An improvement of the overall skills of all partners, as the project explores subjects at the boundary of their respective areas of expertise.
- Recruitments at all partners. Jobs will be created for the duration of the project and more in the research team. We expect others to follow suit as the project gathers momentum.
- A major development in new technologies and processes, some of which are actively considered by all major armies around the globe (combustible and reactive fragments …).
- Ultimately, the development of new products and new product lines, at all industrial partners, and the opening of new strategic possibilities for end users, by providing an economically viable answer to emerging threats.

To summarize, we propose to use new and innovative processes and technologies to improve rocket systems while maintaining their affordability and practicality. In practice, we intend to study four technological building bricks that may improve the performances and range of rocket systems. Depending on the results of each brick, we intend to integrate these building blocks in existing guided and unguided rocket munitions, to allow them to address a wider range of targets, and, in a longer term to develop brand-new munitions, to address an ever-growing variety of threats.

CONTACT INFORMATION

Coordinator
Wilfried THIEBAUT
Thales Belgium
wilfried.thiebaut@be.thalesgroup.com

Partners
Romuald VAN RIET
Royal Military Academy
romuald.VanRiet@mil.be

Jean-Hervé LECAT
Lambda-X
jhlecat@lambda-x.com

Thomas GODFROID
Materia Nova
thomas.godfroid@materianova.be

LINK(S)

/