Pragmatic Modelling of High Energy Lasers Effects Against Small Drones

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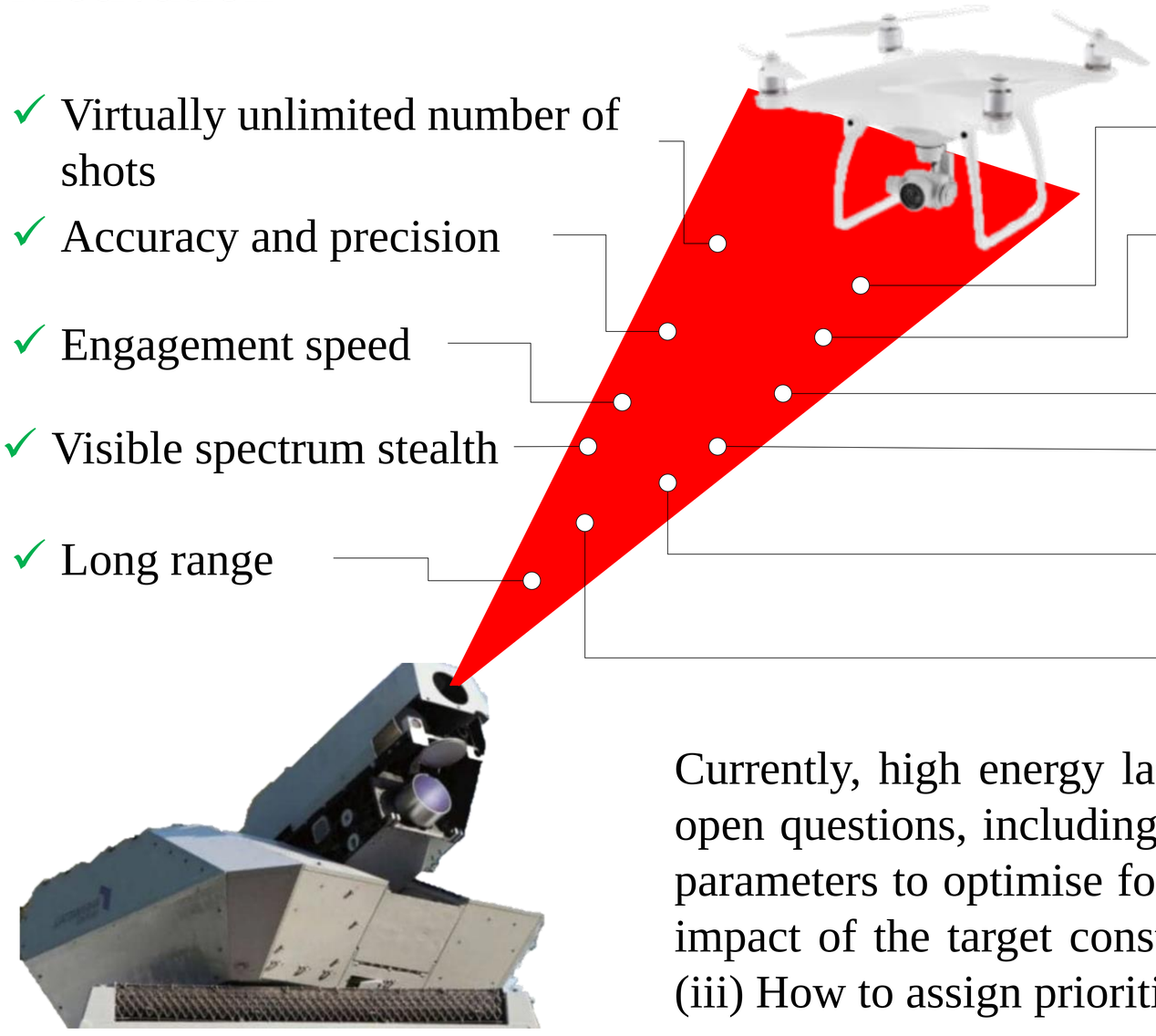
Abstract

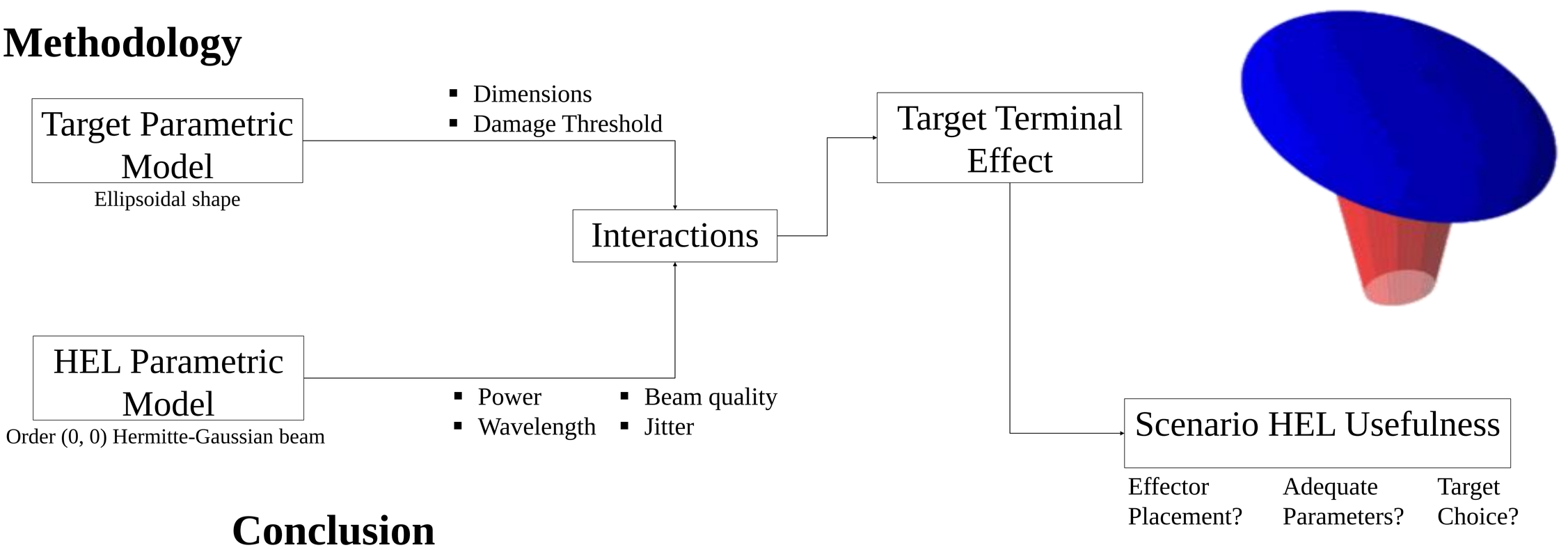
Aware of the evolving threat posed by unmanned aircraft systems (UAS), commonly known as drones, BELDEF is funding the DAP2212 project, which aims to develop a software predicting the performance and risk associated with the use of counter-UAS (CUAS) solutions along the killchain. Amongst the plethora of existing CUAS effectors, high energy lasers (HEL) are gaining interest from various actors. This study proposes parametric modelling of both HEL and UAS, allowing for sensitivity analyses to be conducted, in turn enabling the evaluation of HEL performance when used in various scenarios. Once evaluated and understood, those performance can be integrated in the broader evaluation of CUAS killchains by simulating combinations of HEL with other effectors and/or sensors, thus providing a more comprehensive understanding of complex CUAS systems combinations.

Motivation



Currently, high energy lasers used as CUAS means are bound to a lot of open questions, including, but not limited to, (i) what are the most critical parameters to optimise for maximising laser effectiveness? (ii) What is the impact of the target constitutive material on global effector performance? (iii) How to assign priorities to multiple targets?

Methodology



Conclusion

This research identifies the high energy laser parameter(s) most critical to reach a desired output on a desired target, given a scenario. This is done by combining parametric models for both the weapons and targets. In addition, a flavour of target prioritisation is given for specific weapon/target scenarios.