

BAE Systems looks at Laser Developed Atmospheric Lens concept for battlefield commanders

January 18 2017, by Nancy Owano



(Tech Xplore)—Future concepts from BAE Systems include a laser developed atmospheric lens. A video shows the concept and explains the thinking behind it.

Looking at years from now, current surveillance systems will need to be enhanced. Adversaries will be using advanced anti-aircraft weapons to prevent surveillance, said the video captions, and the video showed a person reading a screen with the message on the screen, "camera image target out of optimal range"—not what a commander likes to discover.

"Our aircraft could use a Laser Developed Atmospheric Lens to observe adversaries from very [long distances](#) away, using the Earth's atmosphere as a tool," according to the video.

The device would use [high power](#) pulsed lasers—to create a lens by manipulating the Earth's atmosphere through reversible heating or ionisation.

This could allow commanders to magnify or change the path of [electromagnetic waves](#) such as light and [radio signals](#), according to the video. And it would allow commanders to view battlefields more effectively from long distances, to collect information.

The concept is offering a more versatile single surveillance and defense solution for future commanders, according to the video.

BAE Systems similarly highlighted that vision in a newsroom article:

"Within the next fifty years, scientists at BAE Systems believe that battlefield commanders could deploy a new type of directed energy laser and lens system, called a Laser Developed Atmospheric Lens which is capable of enhancing commanders' ability to observe adversaries' activities over much [greater](#) distances than existing sensors. At the same time, the lens could be used as a form of 'deflector shield' to protect friendly aircraft, ships, land vehicles and troops from incoming attacks by high power laser weapons that could also become a reality in the same time period."

Shedding their light on this concept, *The Engineer* on Monday said that "the so-called Laser Developed Atmospheric Lens (LDAL) concept, works by simulating naturally occurring phenomena and temporarily creating lens-like structures in the Earth's atmosphere which can be used to magnify or change the path of electromagnetic waves such as light and radio [signals](#)."

The Engineer report said that, according to BAE, "mirrors, glass lenses, and structures like Fresnel zone plates could all be replicated using the atmosphere, allowing the physics of refraction, reflection, and diffraction to be exploited."

BAE Systems said the LDAL concept was evaluated by the Science and Technology Facilities Council (STFC) Rutherford Appleton Laboratory and specialist optical sensors company LumOptica.

The BAE newsroom article quoted Craig Stacey, CEO at LumOptica: "This is a tremendously exciting time in laser physics. Emerging technologies will allow us to enter new scientific territories and explore ever new applications."

The article also quoted Prof. Nick Colosimo, BAE Systems: "Working with some of the best scientific minds in the UK, we're able to incorporate emerging and disruptive technologies and evolve the landscape of potential military technologies in ways that, five or ten years ago, many would never have dreamed possible."

More information: www.baesystems.com/en-us/artic...-future-battlefields

Citation: BAE Systems looks at Laser Developed Atmospheric Lens concept for battlefield commanders (2017, January 18) retrieved 18 April 2024 from <https://techxplore.com/news/2017-01-bae-laser-atmospheric-lens-concept.html>

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