

PASSIVE UVC AND IR DETECTION OF GUNFIRE

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The past decade has marked an era of uncertainty and profound changes. Defence tries to contribute to peace and security by stimulating a greater stability in the world. Think of the “peace keeping”, “peace making” and “peace enforcement” operations, humanitarian aid and the fight against terror. As a result of the nature of the mission, Defence emphasizes more and more the protection of helicopters and of heavy transporter aircraft and troop carriers. In order to protect the crew of the aircraft, it is essential that they can detect any threat in time. Missile Warning Systems have many times proven their use. However, aircraft can also encounter the threat of non-guided arms. Machine guns aren't sophisticated but they are a widespread threat that can be used by everyone. The shooter aims on sight. The enemy will probably not hit the target at the outset. To aim the weapon, he will use tracers. It is obvious that a detection module is necessary to protect the helicopter crew against machine gunfire .

Since visible light detection exhibits too many false alarms , passive detection of gunfire can be twofold as shown by the experimental results presented in this paper :

- either by thermal IR imagers , enabling longer detection ranges but subject to several false alarms
- or by solar blind UVC between 180nm and 290nm. This UVC is less subject to false alarms because, on Earth , the single natural UVC sources are the lightnings (solar UVC being stopped by the ozone layer at an altitude of about 20km) .

Thermal IR imagers can detect tracers as well as ordinary bullets . UVC detectors can only “see” tracers.

Some experiments excluded that thermal imagers can see the bullet shock wave; they can only see the bullet itself.

The authors hope to have contributed to the development of a gunfire warning module aboard a helicopter