

AGENDA ITEM 10

SPIN-OFF BENEFITS OF SPACE TECHNOLOGY: REVIEW OF CURRENT STATUS

SOUTH AFRICAN STATEMENT

03 JUNE 2023

Mr Chair,

Over the last few years, the South African government has made significant investment in the development of space technology, which has yielded socio-economic benefits and additional terrestrial application. One such example is the development of the K-Line imaging technology for detecting forest fires.

Mr Chair,

Wildfires occur regularly in South Africa and often cause significant damage. The combination of climate and vegetation characteristics that favour fires, and growing human exposure, results in significant wildfire risk across the country, especially in the southern and eastern parts. The worst wildfires to date were those which swept through parts of the Garden Route in the Southern Cape in June 2017, with the town of Knysna and its surrounds bearing the brunt of the devastation. The economic damage cost is estimated to be around US\$211 million, which excludes untold losses such as the loss of homes, businesses and jobs. Sadly, the situation will not improve because climate change will result in more frequent and extended high fire danger periods and, therefore, an increased likelihood of severe fires.

Since 2016, the Council for Scientific and Industrial Research (CSIR) has been developing K-Line imaging technology for the detection of forest fires from space. The technology uses the optical sensing techniques for the detection of potassium light energy (hence atomic element K) emitted from the fire combustion process. This energy manifests itself and line spectra in the near-infrared part of the spectrum. The K-line

detection principle has significant implications for developing sensing systems that can detect the presence of potassium light as an indicator of the presence of a fire combustion process.

The project started in collaboration with the Cape Peninsula University of Technology (CPUT) and with support from the national Department of Science and Innovation (DSI) and the South African National Space Agency (SANSA). The output of the collaboration was the K-Line imager onboard ZACube-2, serves as a spaceborne laboratory for the experimentation and further development of the K-Line sensor to improve effectiveness.

Mr Chair,

The K-Line technology has spin-off terrestrial applications in the detection of gunshot muzzle flashes, which can be applied to civil security and defense environment to report on gun-related incidents, and the detection of fires from an unmanned aerial vehicle (UAV) platform. I will now update on the developments on the latter application of K-Line on UAV.

Mr Chair

The K-Line UAV payload can be used for tactical operations as part of a fire disaster management capability. This technology development is of lower complexity and risk, and with a shorter route-to-market when compared to the space application. The K-line UAV payload development programme was initiated in October 2021 to develop a first iteration prototype that can be flown to support fire field measurement experiments. The prototype was completed in February 2022 with the first flight tests executed in March 2022.

In closing, My delegation looks forward to presenting more results and the operationalization of the application in future meetings.