**Aeolus laser doppler**

**On the 22nd of August ESA launched its new Earth Explorer satellite Aeolus from the European spaceport in Kourou. After deployment and startup of the satellite, calibration tests are being conducted to check the satellite’s Atmospheric Laser Doppler Instrument (ALADIN). This is the first of its kind in space.**

**Now by underflying the satellite and comparing its measurements with airborne reference similar instruments the Aeolus scientists can further develop the algorithms that will be used to interpret the raw Aeolus data and see whether the satellite delivers on its promise for weather forecasting.**

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| 10:00:00 | ESA leader  |
| 10:00:10 | Title: **Aeolus laser doppler** |
| * EXT. Aeolus Vega launch – Arianespace Kourou, French Guiana – ESA - August 22th 2018 (3shots)
* ANIMATION. Vega with Aeolus in space – ESA – 2018 (1shot)
* INT. Flight control centre Aeolus Vega launch – Arianespace Kourou, French Guiana – ESA - August 22th 2018 (3shots)
* ANIMATION. Aeolus deployed in space – ESA – 2018 (1shot)
 | Like a flash ESA’s Aeolus satellite soared into the heavens on August the 22nd. Launched on top of the lightweight Vega this 500 million euro bird finally arrived in its polar orbit 320 kilometers above Earth. A joyous occasion for the many scientist and engineers who have worked on this mission, but also for the meteorological community who have been eagerly awaiting this satellite’s data for many years. Now it is up to this groundbreaking Earth Explorer satellite to prove its worth and deliver the promises of accurate wind profile data from space. |
| 10:01:01:10* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **ITW Thomas Kanitz, Performance and processor Engineer Aeolus Project - ESA***The launch was for us a very exciting moment after so much waiting. And it was very exciting for all the people involved at the launch site but also in the flight control centre and at home following the live-stream. It went quite well, after two days we checked out the satellite with the main functions and after ten days we could already put on the laser.*  |
| 10:01:22:05* INT. Aladin instrument in Lab – Airbus Defense and Space – unknown date (6shots)
* ANIMATION. Aeolus lidar pulses – ESA – 2017 (2shot)
* ANIMATION. Aeolus Pan around – Airbus Defense and Space – 2017 (1shot)
* ANIMATION. Aeolus lidar pulses – ESA – 2017 (1shot)
* INT. Aeolus in Cleanroom – Airbus Defense and Space Toulouse, France – ESA – June 2018 (2shots)
 | This laser is part of the newly developed Aladin instrument, the beating heart of Aeolus. Aladin or atmospheric laser doppler instrument is a space borne wind lidar and the first of its kind. Developed by Airbus Defense and Space It uses two powerful lasers which beam ultraviolet light towards the ground. This light bounces off air molecules and other particles such as dust, ice or water in our atmosphere. These particles then reflect part of the light back towards the satellite, which is also equipped with a large telescope and sensitive receivers. By collecting this scattered light and using the Doppler effect it is able to measure wind profiles at different altitudes. This cutting edge technology has never been flown on a satellite and before meteorologists can start using Aeolus data in their weather predictions ESA has to properly test and calibrate the satellite. |
| 10:02:25:03* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **ITW Thomas Kanitz, Performance and processor Engineer Aeolus Project - ESA***We operate Aeolus already for a couple of weeks now and we learn every day basically with operating the satellite. We had the commissioning phase which means we had the first calibrations of the platform, of the instrument. We have the first in orbit calibrations for the data analysis which is also important for us. Also to assess the measurements. And now we are in a phase, it’s a kind of transition. We start now with a phase where we also look at external data from calibration and validation teams to further assess our Aeolus performance.* |
| 10:02:58:08* INT. Airplane hangar DLR with Falcon 2020 airplane – DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
* INT. Falcon 2020 scientific instruments and scientist validating – DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (2shots)
* INT. Airplane hangar DLR with Falcon 2020 airplane detailed shots of instruments at bottom of the plane – DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
* EXT. Overpfaffenhofen airport Falcon 2020 taking of – DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | One of the ways to validate performance is by flying a specially modified aircraft while the satellite is passing overhead. Here at DLR in Oberpfaffenhofen Germany a validation team uses a falcon 2020 to follow the satellite’s path and cross examine the Aeolus data against the data of two instruments they carry onboard. One of these is a trusted classic reference wind lidar with a proven record, the other one is a twin of Aladin. By cross checking their data they can further calibrate and validate Aeolus instrument. The team can also use the results to further develop and refine algorithms used to process raw Aeolus data and create wind profiles suitable for numerical weather forecasts. The quality of these algorithms is as crucial for the precision of the derived wind profiles as the quality of the satellite’s instruments. |
| 10:04:01:00* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
* EXT. Overpfaffenhofen airport Falcon 2020 in flight – DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
* INT. Falcon 2020 scientific instruments and scientist validating – DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (2shots)
* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **ITW Oliver Reitebuch, Lidar scientist - DLR***DLR has actually two roles in this Aeolus programme. We are doing the airborne validation in cooperation with ESA but we are also working on the retrieval algorithms in an expert team for the algorithms and the processes for the satellite. So this synergy is very very important and unique so we can actually use the lessons learned from the airborne programme to implement in the satellite programme.// We have done our first underflight and the qualitative comparison between the measurements onboard the aircraft and the satellite looks very good. So this is very promising and we can use this to actually improve our future data product quality from the satellite.* |
| 10:04:47:04* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (2shots)
* Animation Global wind profiles -ESA – 2018
* ANIMATION. Aeolus in orbit – ESA – 2017 (1shot)
* ANIMATION. Aeolus Pan around – Airbus Defense and Space – 2017 (1shot)
 | After a few months in orbit Aeolus has impressed the scientist working on the programme and it seems we do have the first space borne wind lidar generating accurate global winds profiles for the meteorological community. Now data and algorithms are still being refined but soon ESA and its Aeolus partners will start working on implementing these winds profiles into numerical weather predictions. Then Aeolus can give meteorologist the data they have been been asking for, for so long. |
|  | **B-ROLL** |
| 10:05:18:19 (1902\_002\_BR\_001) | **AEOLUS\_LASER\_DOPPLER - A-Roll without logo and titles – audio split** |
| 10:10:27:13* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **Thomas Kanitz, Performance and Processor Engineer** **Aeolus Project , ESA****English****Soundbites*** Feedback from the Meteorological community
* Role of ESA in Aeolus Programme
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| 10:11:36:04* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **Thomas Kanitz, Performance and Processor Engineer** **Aeolus Project , ESA****English****Soundbites*** On the Aeolus launch
* Aeolus validation phase and commissioning
* First Impressions and results
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| 10:13:35:04* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **Oliver Reitebuch, Lidar Scientist, DLR****English****Soundbites*** Role of DLR
* First results
* The process of underflying the satellite
* Instruments on board falcon 2020
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| 10:15:25:10* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (1shot)
 | **Oliver Reitebuch, Lidar Scientist, DLR****German****Soundbites*** Role of DLR
* The process of underflying the satellite
* Instruments on board falcon 2020
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| 10:16:58:00* INT. unknown location, unknown date, - ESA
 | **Josef Aschbacher, Director of Earth Observation Programmes, ESA****english****Soundbites*** Aeolus as a challenge and an achievement
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| 10:17:58:19* INT. unknown location, unknown date, - ESA
 | **Josef Aschbacher, Director of Earth Observation Programmes, ESA****German****Soundbites*** Importance of Aeolus for Science
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| 10:18:52:12* INT. Airplane hangar DLR– DLR Oberpfaffenhofen, Germany - ESA – 27/11/2018 (9shots)
 | **GV's DLR Falcon 2020****DLR Oberpfaffenhofen****Germany****27/11/2018** |
| 10:20:09:15 | **outro** |
| 10:20:20:10 | **END** |