### Data summary

#### EUR, 2010-11

- **January 5-6, 2011**:
  - The top panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from spectral deconvolution algorithm (SDA) of the SPSTAR starphotometer on its mount.
  - The middle panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.

#### EUR, 2011-12

- **March 10, 2011**:
  - The top panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.
  - The middle panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.

#### NYA, 2010-11

- **January 5-6, 2012**:
  - The top panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.
  - The middle panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.

#### NYA, 2011-12

- **March 10, 2011**:
  - The top panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.
  - The middle panel shows the total, fine (sub-micron) and coarse (super-micron) AODs at 500nm from the same very low altitude phenomena observed by the KARL lidar at Ny-Alesund and by CALIOP.

### Conclusions:

Starphotometry is a relatively new technology involving weak-signal problems that are considerably more complex (and costly) than those encountered with daytime sunphotometry (problems that can only be exacerbated in the extreme conditions of the Arctic). Our use of lidar / sunphotometry synergism (along with other auxiliary information such as radar profiles and trajectory modelling) is enabling the assessment of evidence for physically coherent events whose process-level understanding will inevitably generate greater confidence levels in starphotometry retrievals and critical statistics such as multi-year climatologies. Such an assessment is non-trivial in a low AOD (low signal to noise) environment such as the Arctic.

### References

