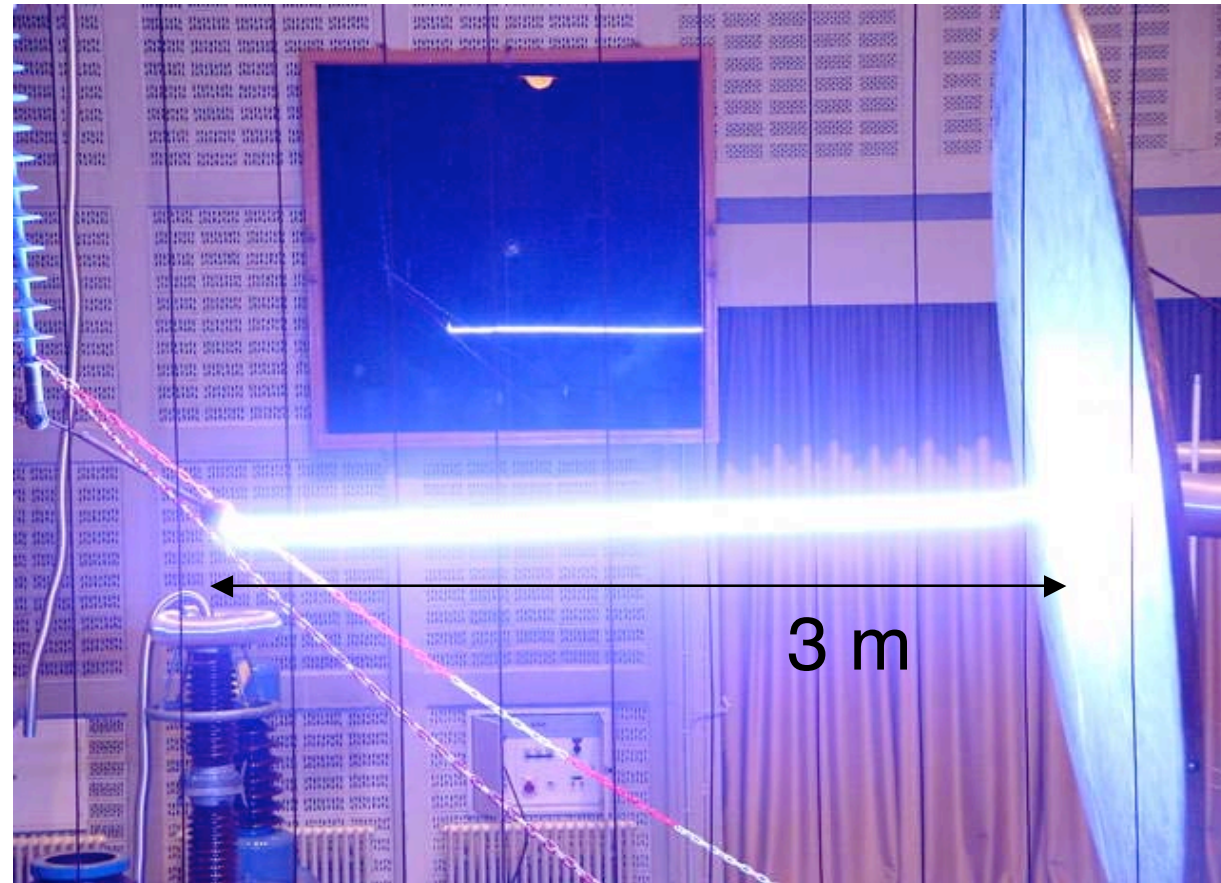


## Laser-controlled lightning

The Teramobile laser permitted us to trigger and guide high-voltage (1 MV) discharges along filamentation in air. Those results open the way to active laser-control of lightning.

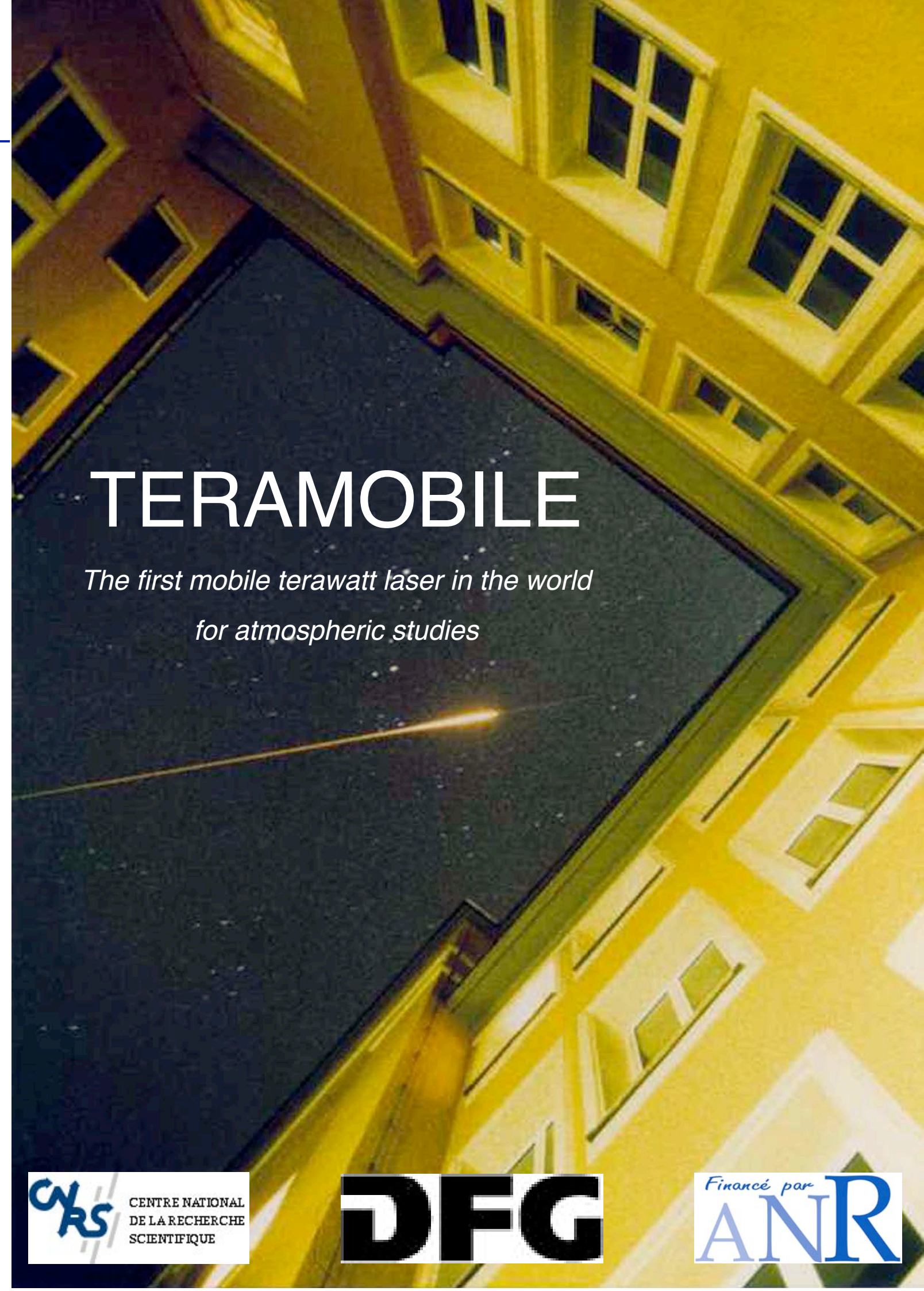


*Laser-guided discharge: straight path and discharge voltage reduced by 30 %*

More under: <http://www.teramobile.org>

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*Cover: white-light filament produced by a fs-TW infrared laser over Jena, Germany*



# TERAMOBILE

*The first mobile terawatt laser in the world  
for atmospheric studies*



## An international collaboration

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Teramobile is an international project initiated jointly by a French-German collaboration of CNRS and DFG. It is now funded by ANR and implies 5 laboratories:

- LASIM (CNRS/University Lyon 1, J. P. Wolf)
- Free University of Berlin (L. Wöste)
- University of Jena (R. Sauerbrey)
- LOA (CNRS/X/ENSTA, A. Mysyrowicz)
- GAP (Université de Genève (J. P. Wolf)

## A unique tool

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The Teramobile system is the first mobile laser yielding **5 terawatts (TW)** and **100 fs** ( $10^{-13}$  s) pulses. It concentrates the state-of-the-art laser technology in a 20' standard freight container, allowing field measurement campaigns (below at Tautenburg observatory, Germany).

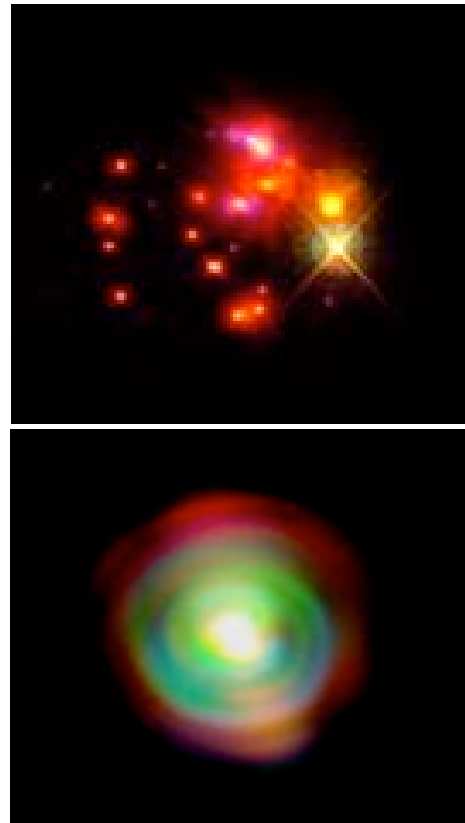


## fs-TW pulse propagation

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The Teramobile laser allows outdoor measurements, hence over very long distances. The non-linear propagation of powerful laser pulses raises fundamental physical questions as well as new application opportunities:

- propagation as **self-guided filaments** by Kerr effect, where the ionised air is electrically conducting (lightning control)
- broadband « white light » continuum generation (230 nm-4  $\mu$ m). This « **white-light laser** » covers the absorption band of many atmospheric pollutants (multi-component optical remote sensing)



## Multi-component Lidar pollution remote sensing

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Our fs-TW laser used as a « white-light laser » allows simultaneous remote sensing of multiple pollutants. We have characterized a urban ozone pollution episode, measuring the several species involved.

*Backscattering of a laser beam up to 10 km: cloud measurement based on multiple scattering*

