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Tree Damage from Chronic High Frequency Exposure?

Mobile Telecommunications, Radar, Point-to-point Transmission Systems, Terrestrial Radio and TV etc.

"Bizarre High Frequency Damage"

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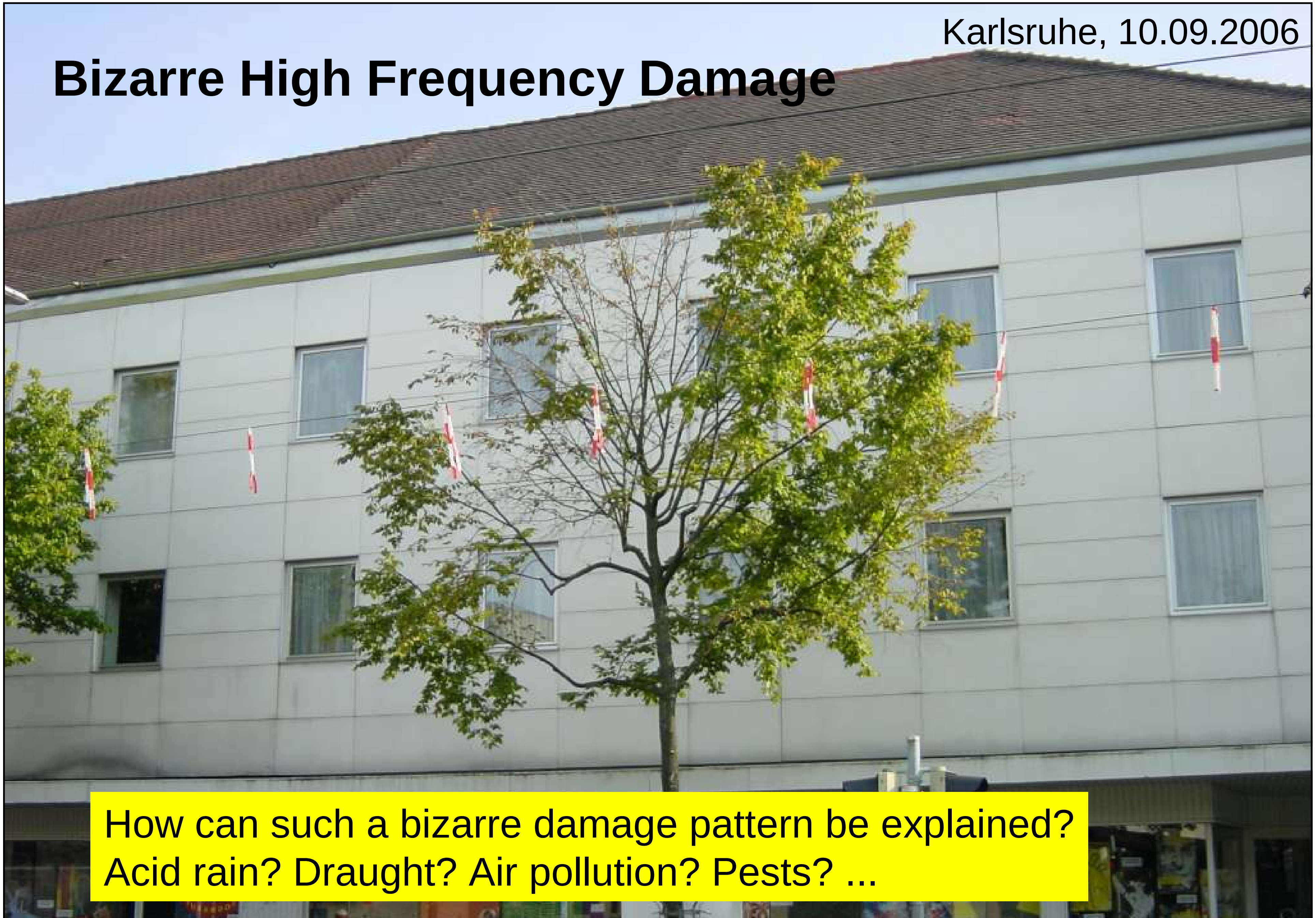
Bizarre High Frequency Tree Damage

Damage which is spatially strongly inhomogeneous
and limited to small parts of a free standing deciduous tree.

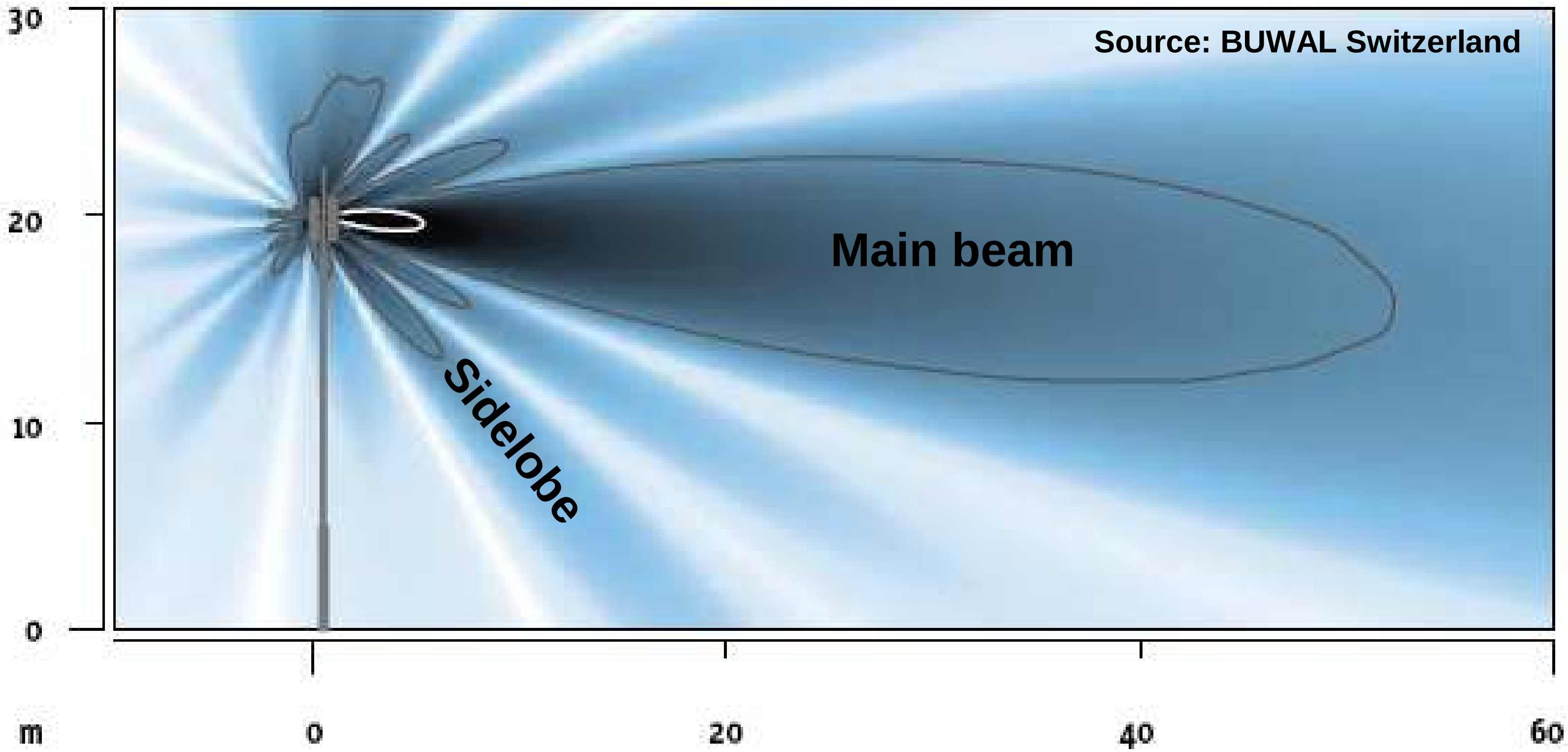
Translation from German by Andrea Klein, London

Bizarre High Frequency Damage

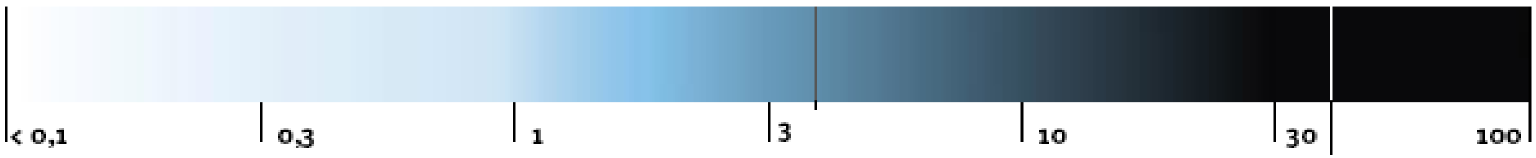


How can such a bizarre damage pattern be explained?
Acid rain? Draught? Air pollution? Pests? ...

Radiation Pattern of a Sector Antenna



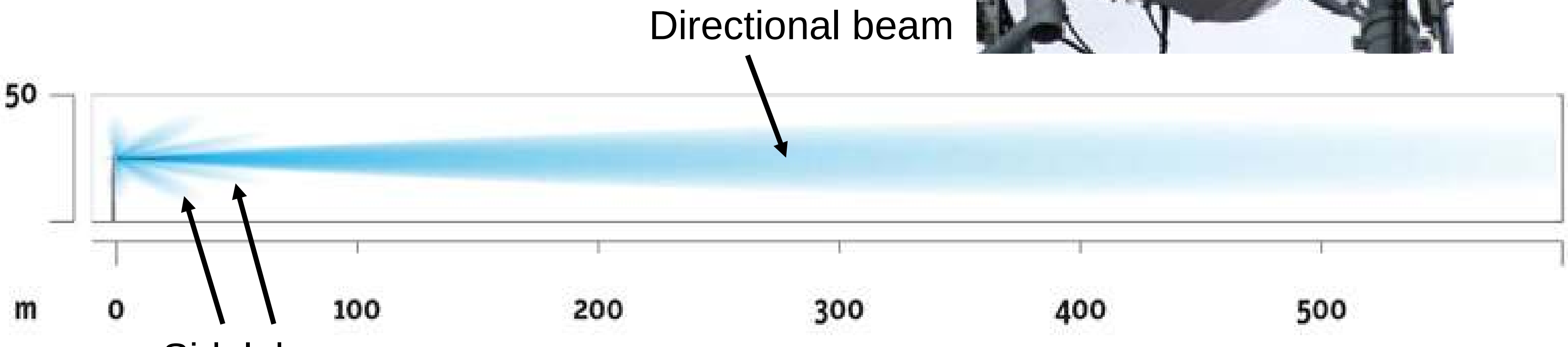
Radiation of a 20 m tall sector antenna for mobile communication (GSM 900 MHz) with an effective radiated power (ERP) of 1000 Watt (Distances in Meters)



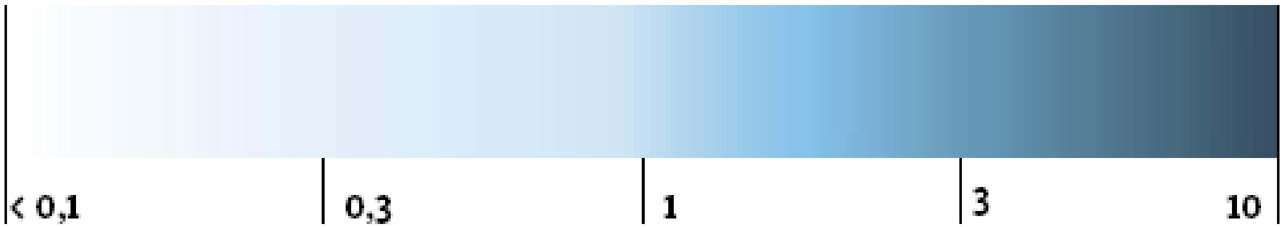
Field Strength in V/m

ICNIRP
Exposure Limit

Point-to-point Transmission Systems



Source: BUWAL Switzerland



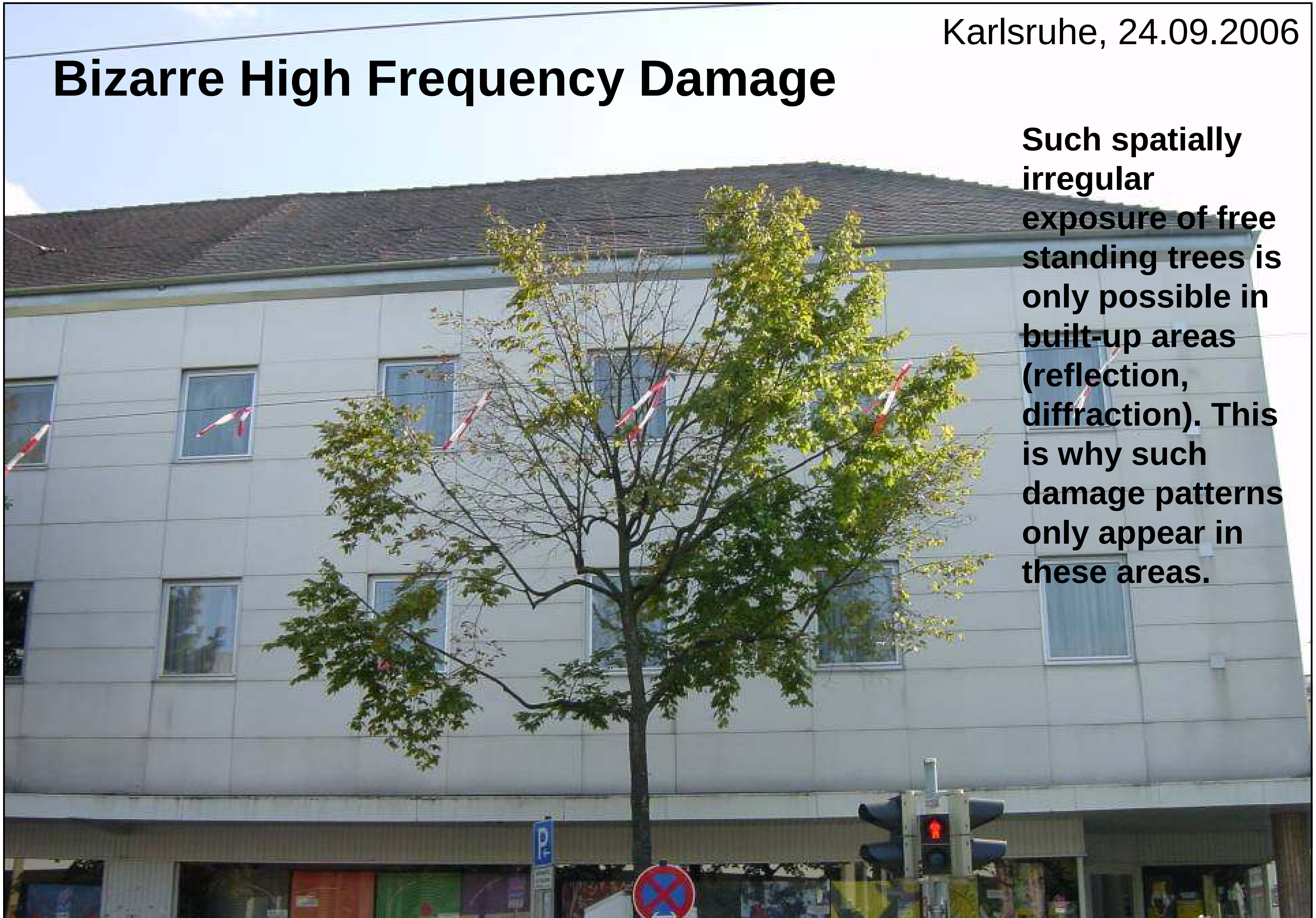
Electrical Field Strength in V/m

Model of explanation, using the example of reflected visible sunlight:

The light of the rising sun, which is still low on the horizon and therefore only at a shallow angle, is reflected onto the wall by a window in a neighbouring house → bright sun spot.
Similarly, the beam of HF radiation from an antenna is emitted in a shallow angle (see radiation pattern). Unlike the sun, HF transmitters do not move. Consequently, a HF radiation spot would not move either. If a tree stood in the way of such a radiation spot, it would be exposed in a spatially inhomogenous way. In the built-up environment, effects such as reflection from metal surfaces (e.g. metal coated thermal insulation glass) and diffraction caused by openings and edges occur often and lead at times to an extremely inhomogenous spatial field distribution (turbulent fields). This is why, it is in the built-up environment - and only here – that we can find spatially very limited, sometimes bizarre damage in inhomogenously exposed trees.

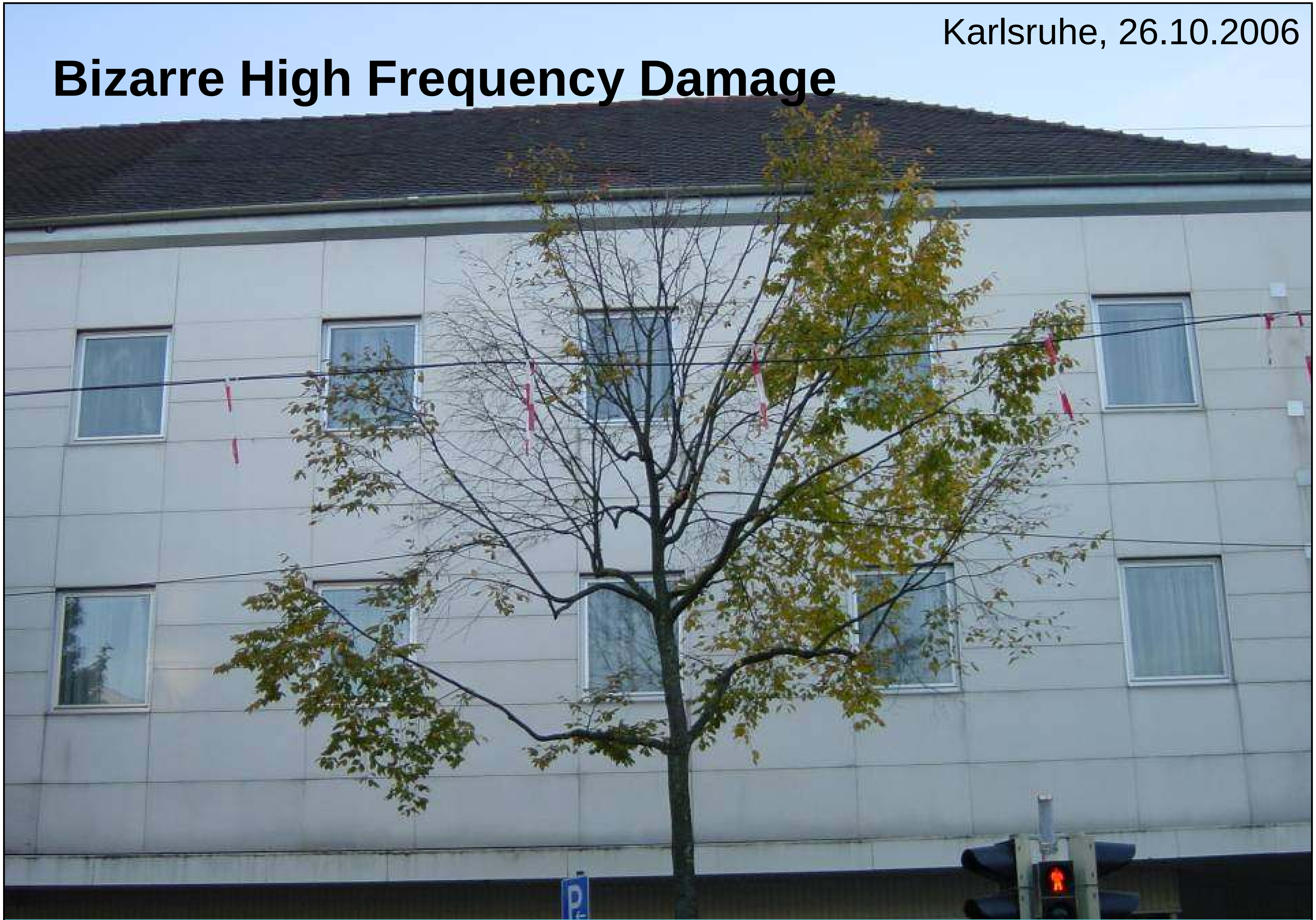
Karlsruhe, 24.09.2006

Bizarre High Frequency Damage



Such spatially irregular exposure of free standing trees is only possible in built-up areas (reflection, diffraction). This is why such damage patterns only appear in these areas.

Bizarre High Frequency Damage



Karlsruhe, 01.11.2006

Bizarre High Frequency Damage

Such spatially bizarre (incongruous) damage patterns are an important indication for a causal relationship between tree damage and chronic high frequency exposure. Specialists experienced in tree disease (but without knowledge of radiation) are at a loss when it comes to providing a conclusive explanation for these novel manifestations. However, when the physics of high frequency radiation propagation (or the spatial distribution of high frequency vector fields) is considered, such damage patterns can be plausibly explained and also why they only occur in the built-up environment.

Karlsruhe, 10.09.2006

Example of small and precisely defined areas of damage in a free standing deciduous tree in the built-up environment.

Examples of small and precisely defined areas of damage in free standing deciduous trees in the built-up environment.

The interaction between radiation and buildings (materials and geometry) in the built-up environment leads to a spatially much more inhomogenous “turbulent” field than in open terrain. This means on the one hand, that in the built-up environment, extremely variable field strengths can be found very closely together (“hot spot” and “colder spot” areas, such as the sun spot on the house wall). On the other hand, in a “turbulent” field, strongly variable HF field configurations (due to different interferences, frequency components, polarisations, etc.) can be found very closely together, without necessarily showing a difference in field strength. If such different field configurations had different biological effects, damaged areas and less damaged areas could be situated very closely together – even in one tree – whilst the field strengths in the different areas would not necessarily show a difference corresponding to the different degrees of damage. This means that, in general, in turbulent fields the damage could not be explained by field strength alone.

If different HF field configurations had different biological effects on different species of trees, it would explain that under a given exposure condition (HF field configuration) not all tree species were affected in the same way. Depending on the exposure condition, a certain tree species would suffer more or less damage than another. Again, field strength would not be the only decisive factor relating to the damage.

Tree Damage from Chronic High Frequency Exposure

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