

Workshop del Tavolo Copernicus Agricoltura e Foreste

Il satellite a servizio delle foreste
Servizi di monitoraggio satellitare per la tutela e la
valorizzazione delle risorse forestali

Intelligenza Artificiale e Radar ad Apertura Sintetica per il monitoraggio forestale

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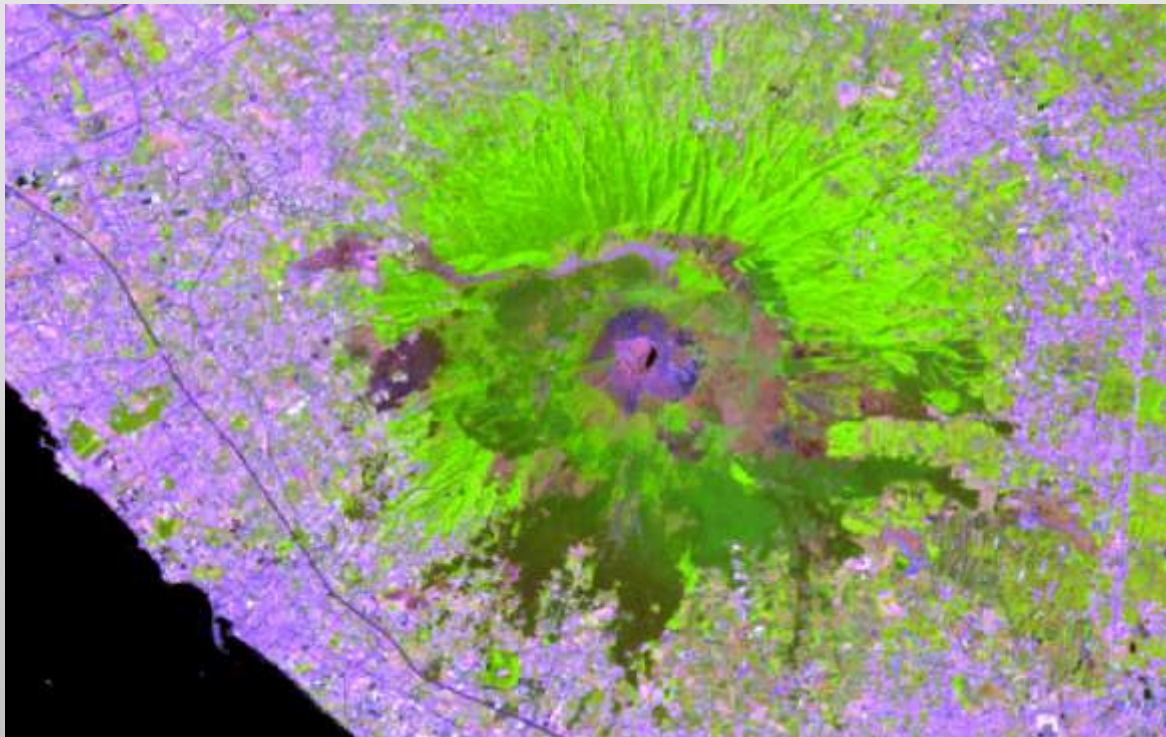


Introduction

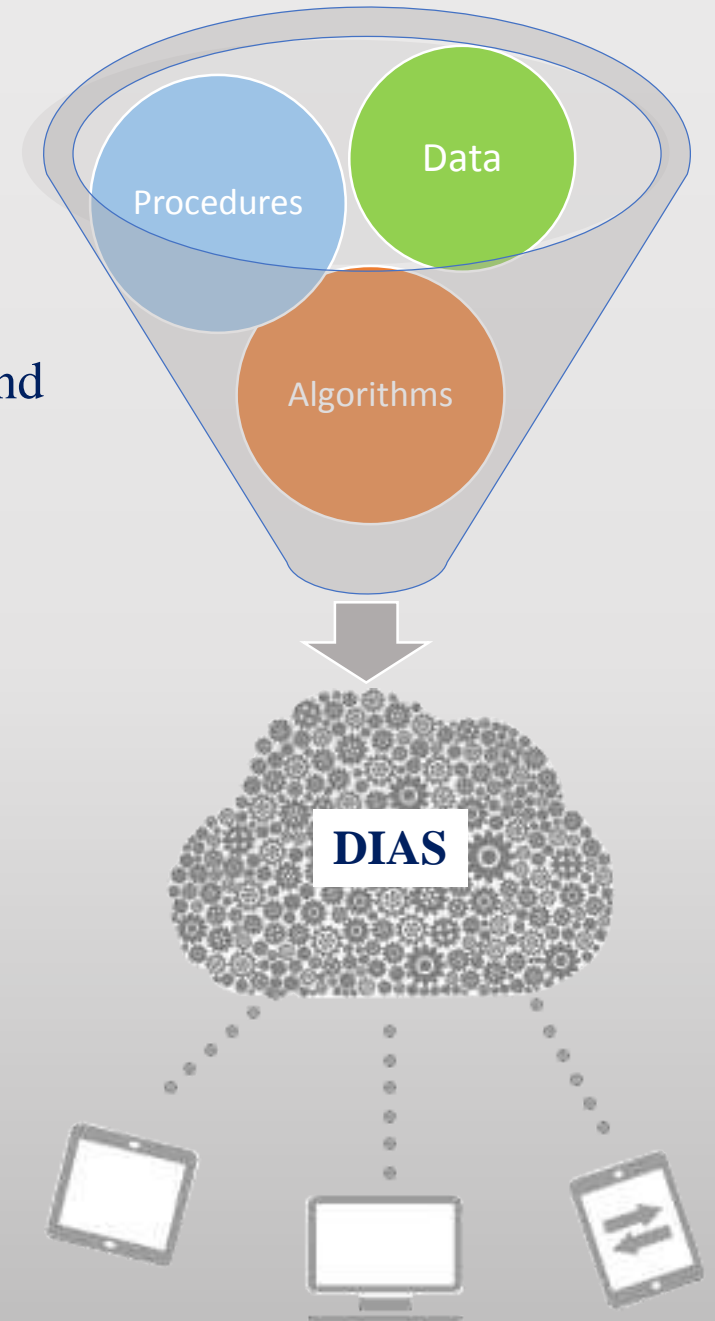
Today new paradigms become to be explored in order to deal with big data

Cloud is a box that must be filled by **Data, Procedures & Algorithms**

Tor Vergata Remote Sensing Group developing novel algorithms and procedures in **Forest monitoring** by **EO** and **Artificial Intelligence**

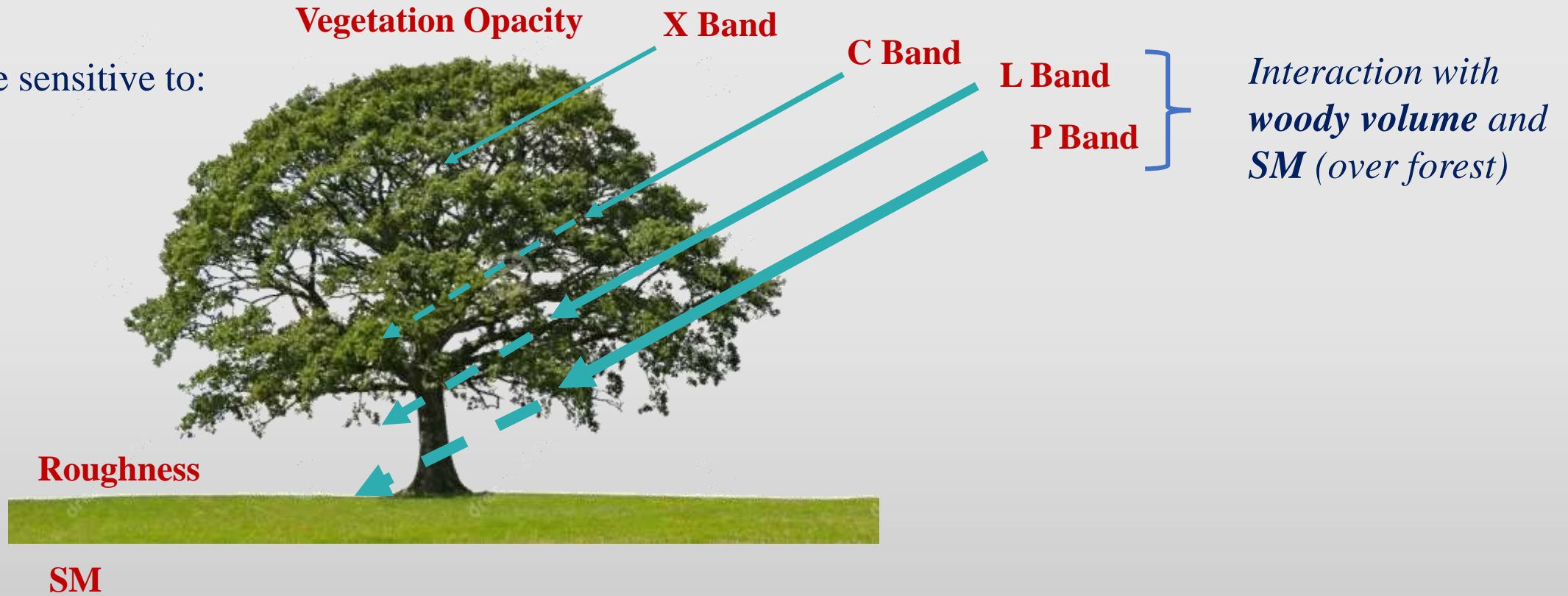


Mt. Vesuvio fire events (Jul. 2017)



SAR interactions over forest

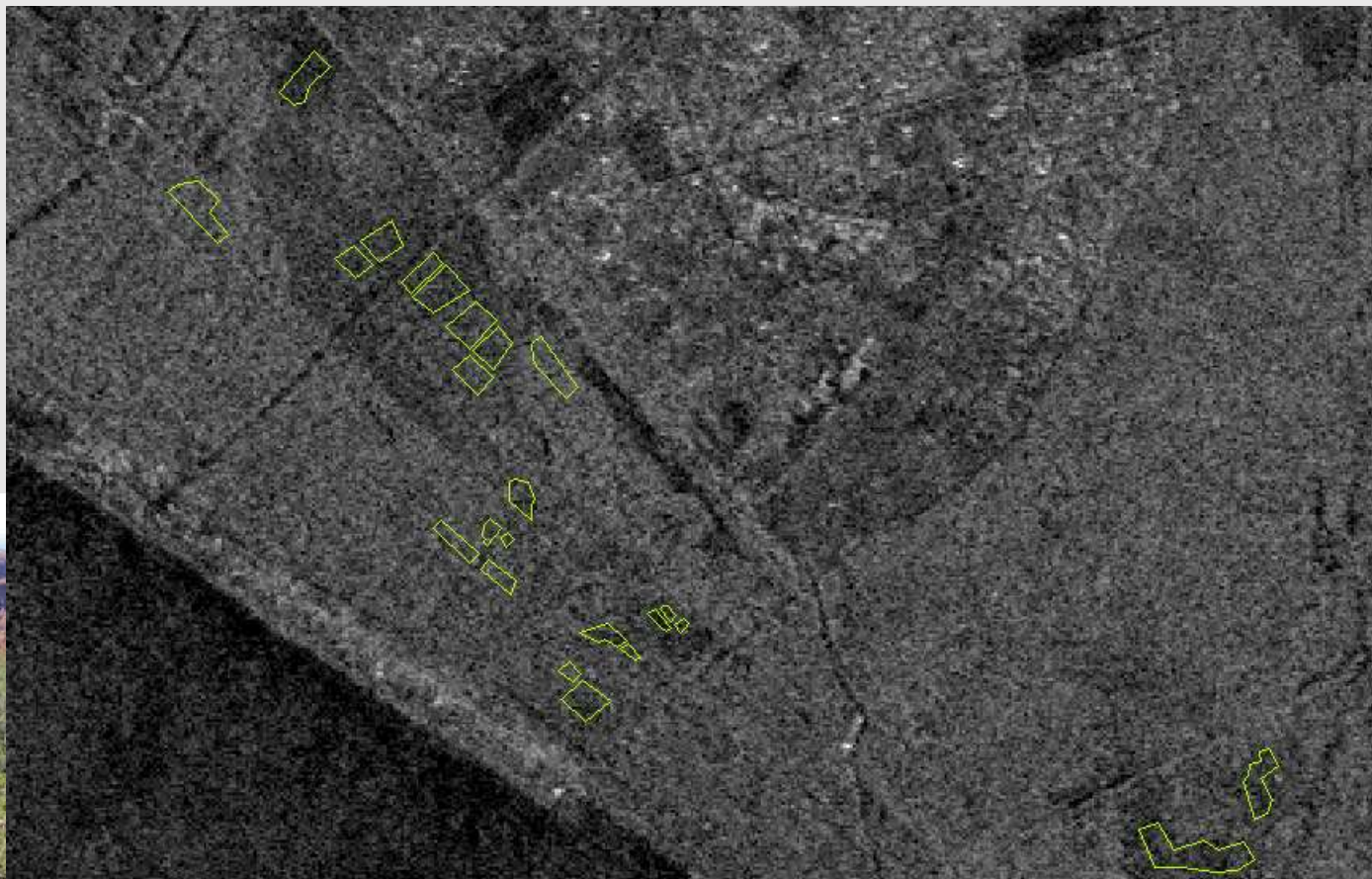
Microwave sensitive to:



The penetration become deeper at the increase of wavelength

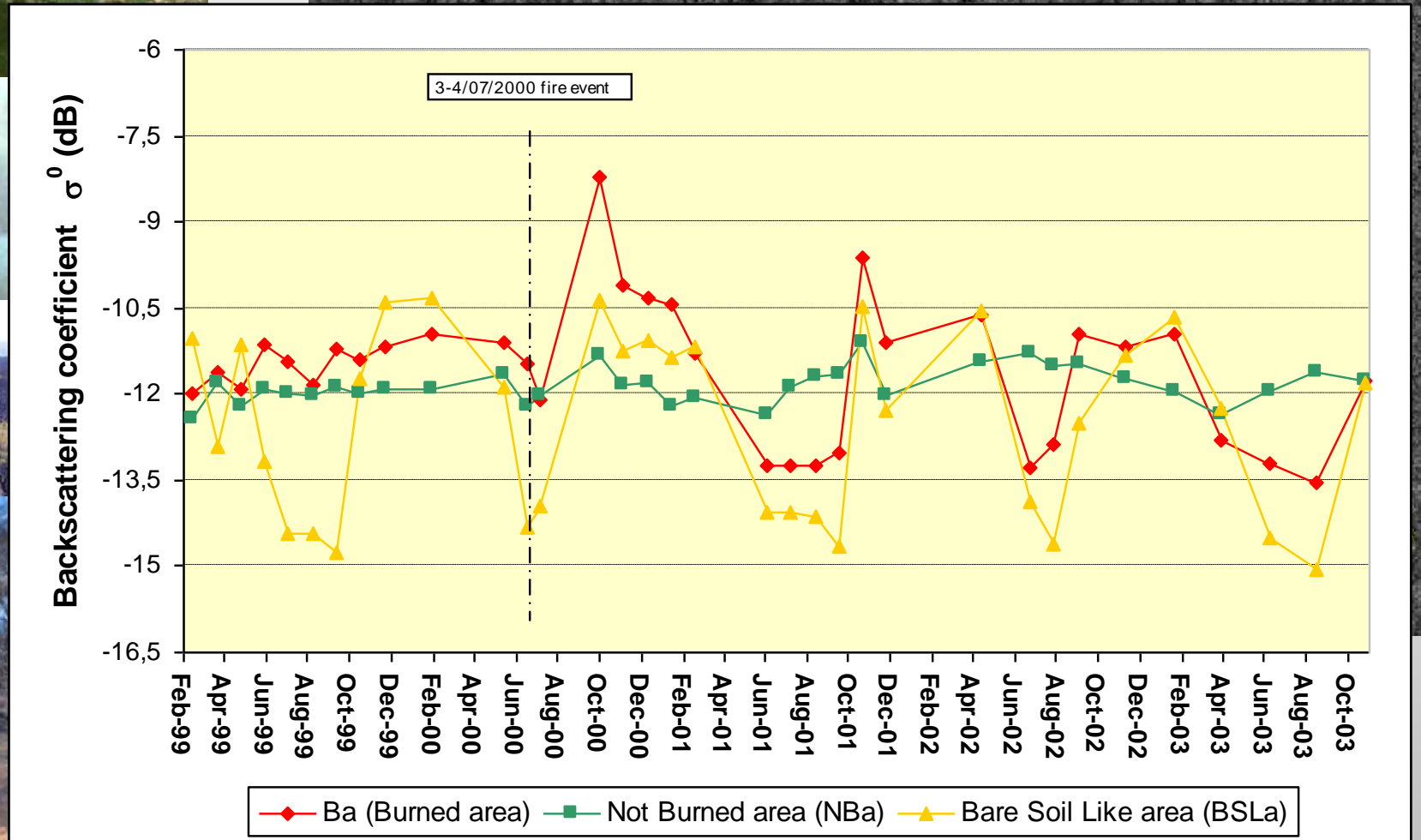
C-band Fire detection and Forest recovery

Castel Fusano fire event (Jul. 2000)



C-band Fire detection and Forest recovery

Castel Fusano fire event (Jul. 2000)

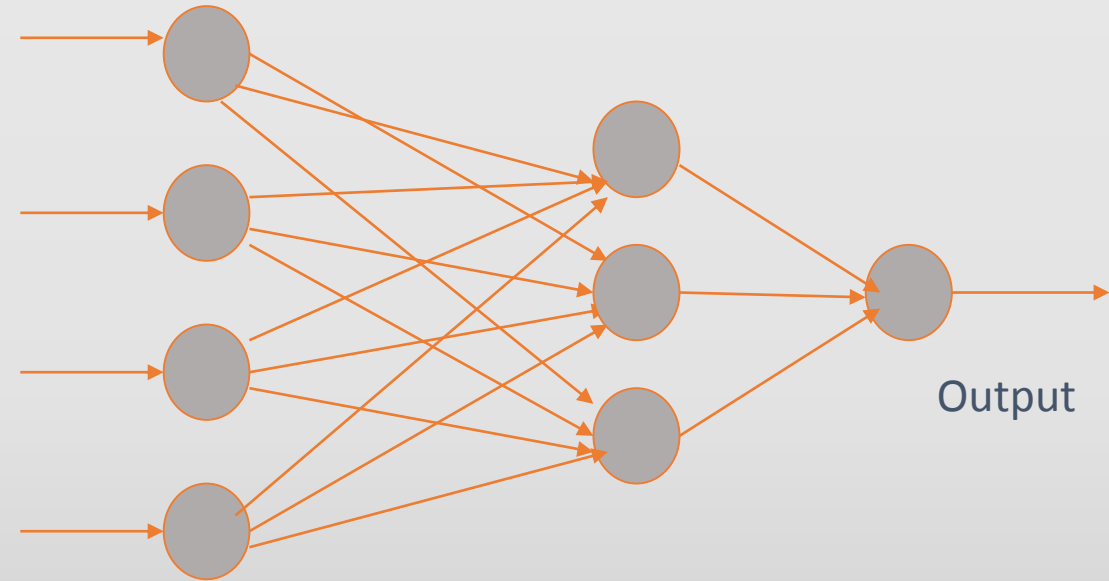


Temporal trend of principal scattering classes

SAR and Neural Network for Forest Biomass estimation

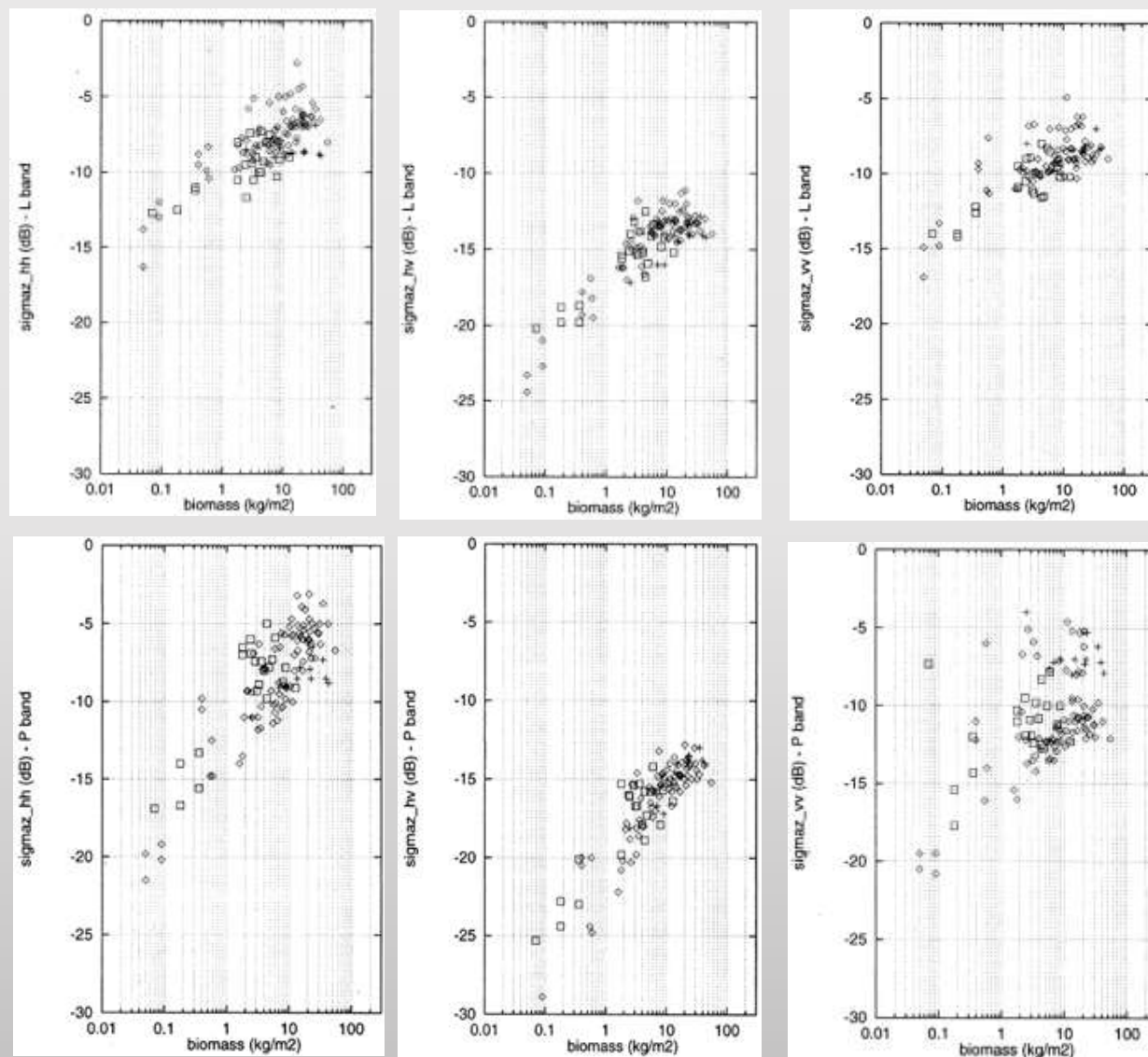
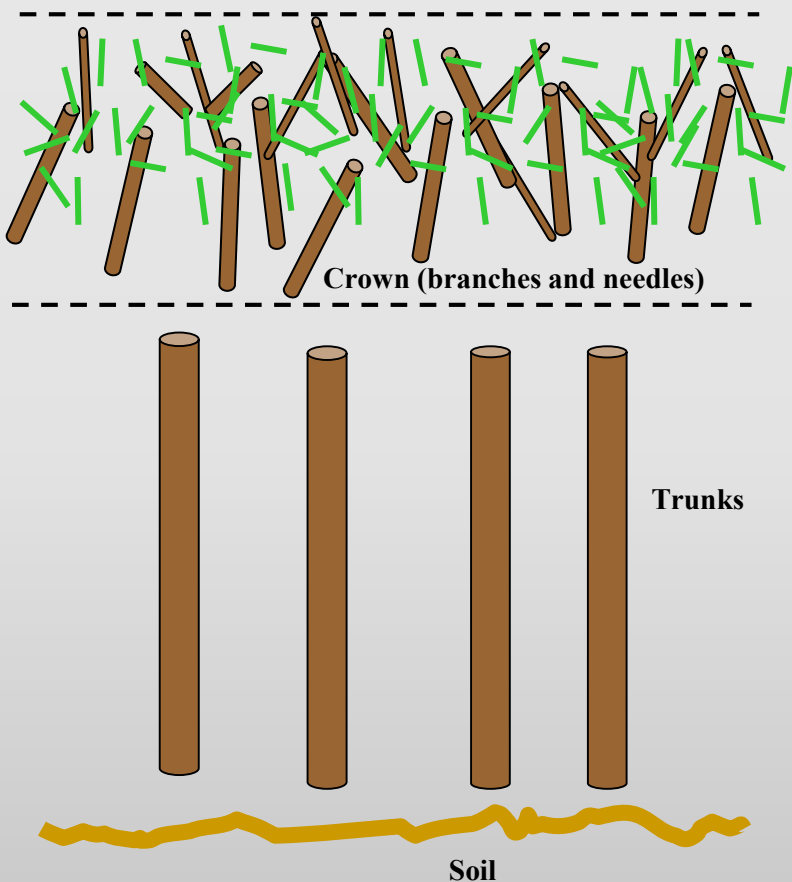
NN strengths:

- ✓ Data driven
- ✓ No ancillary data requirements
- ✓ Solution of ill-posed non linear problems
- ✓ Fast application phase (sec. – min.)
- ✓ Fully automatic



SAR and Neural Network for Forest Biomass estimation

Tor Vergata E.M. Model

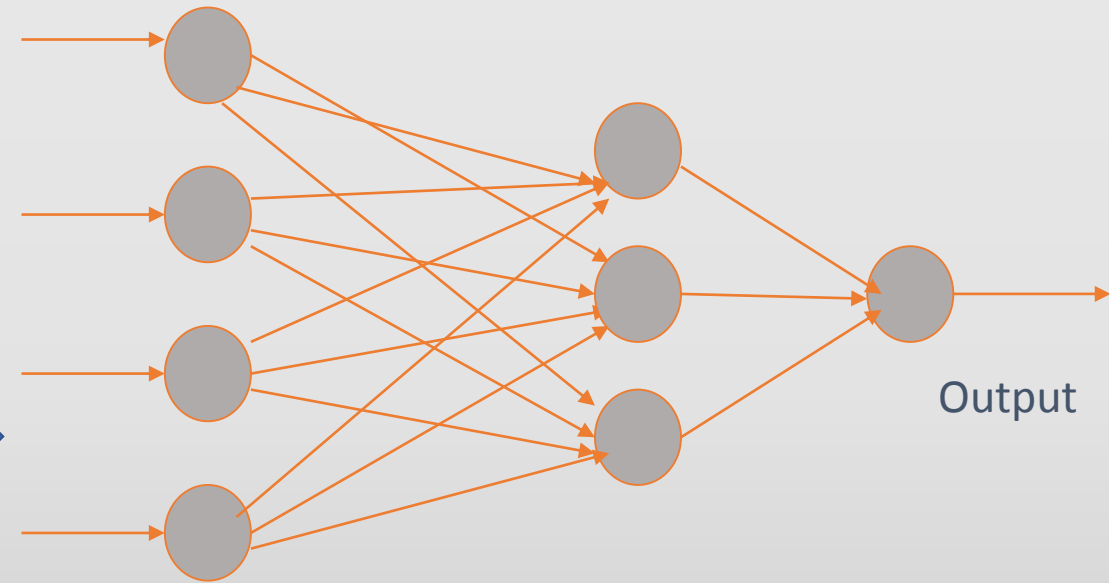
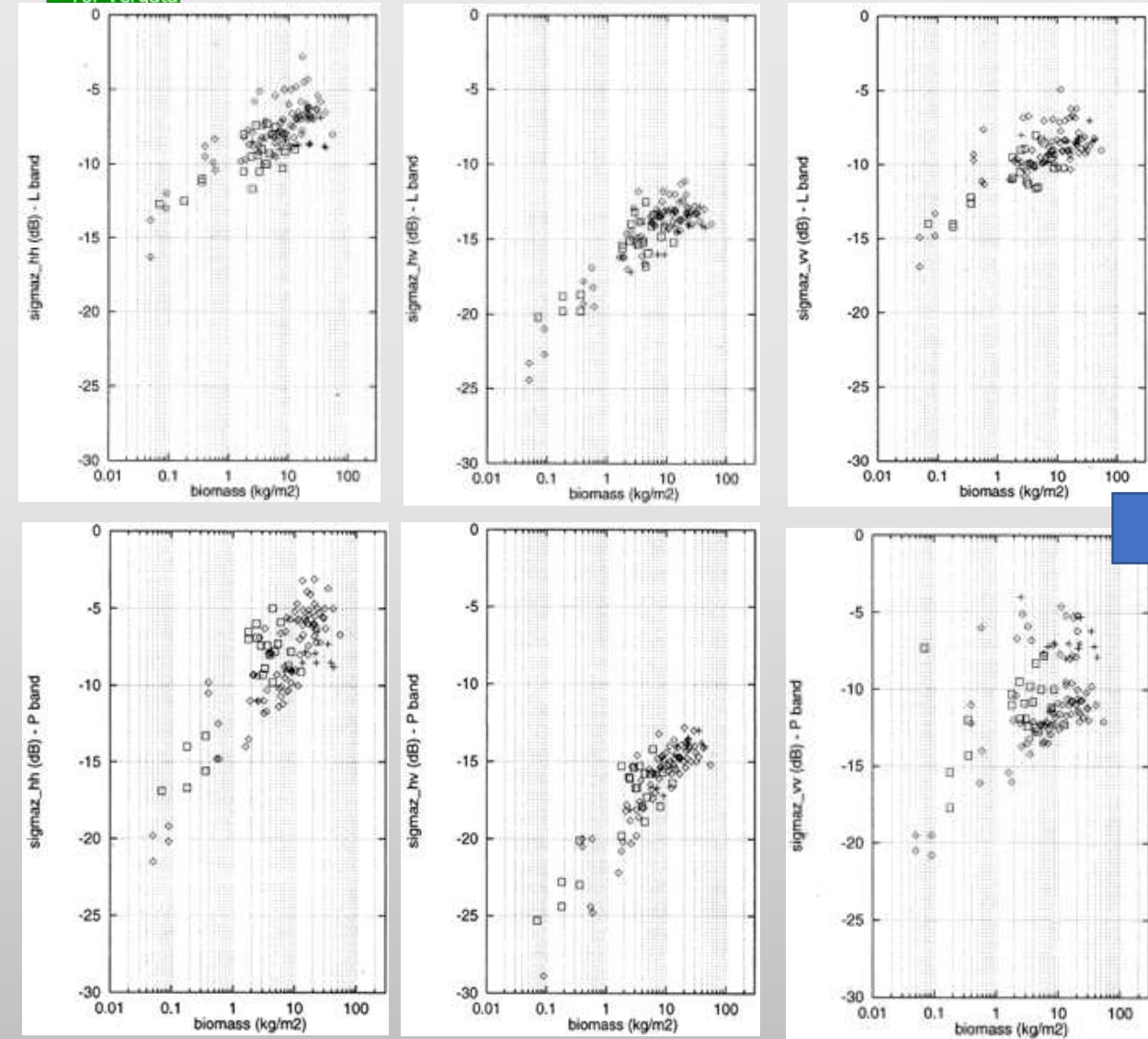


Is based on **radiative transfer theory**

Computes **emissivity** and **backscattering coefficient** of **single components** and of the whole **canopy**

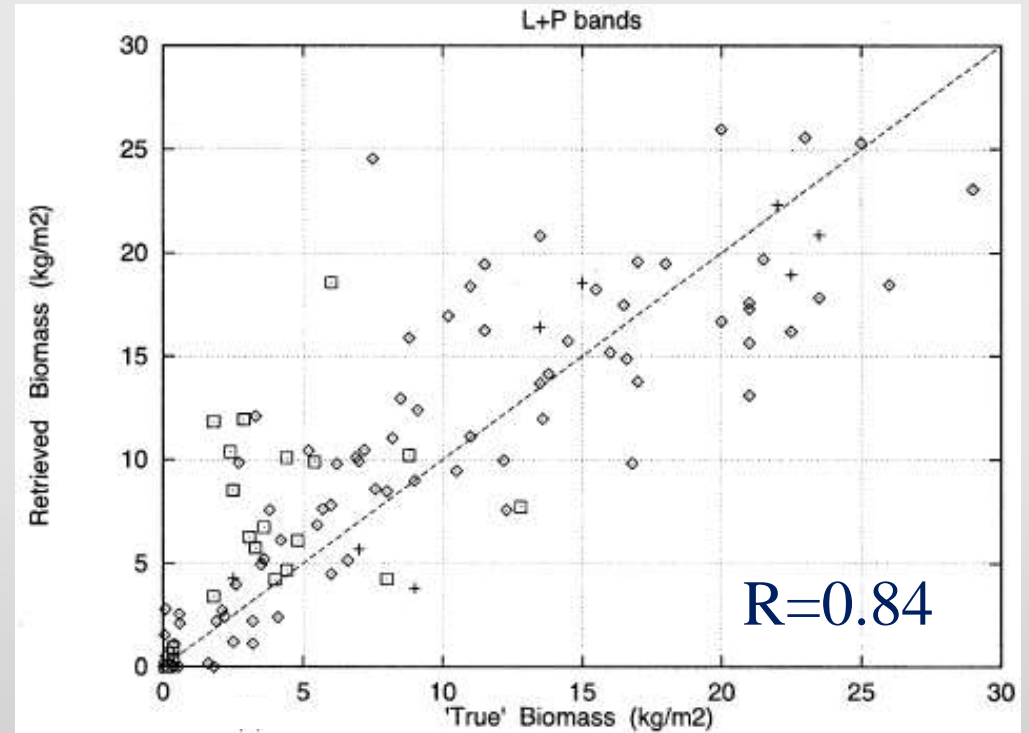
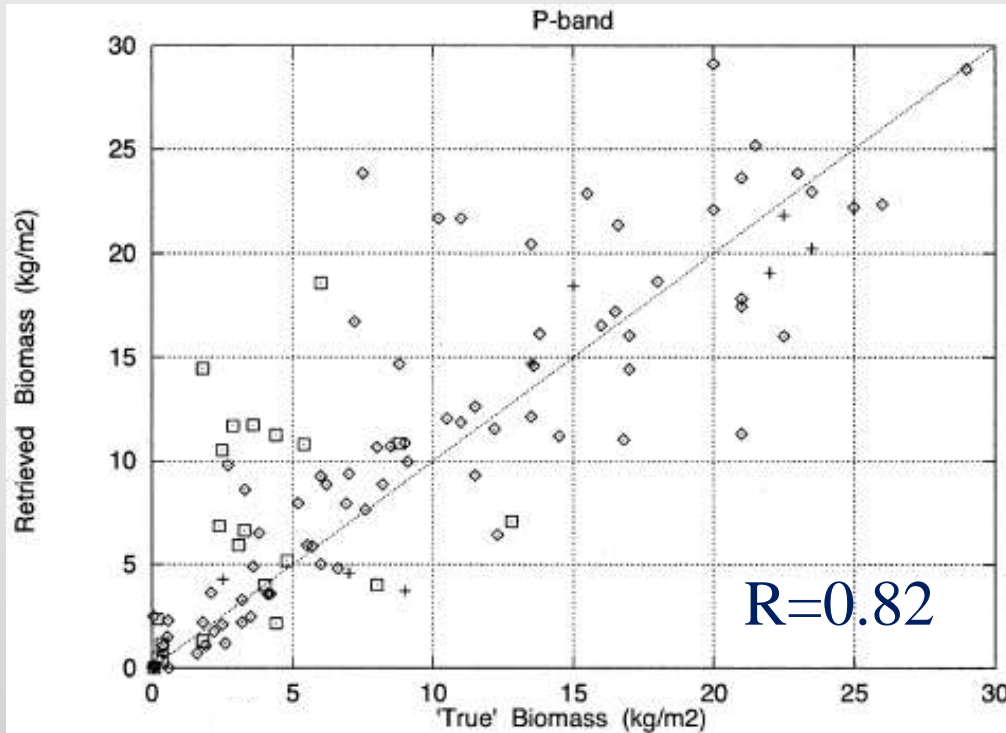
Generation of simulated data by means of Tor Vergata Model

SAR and Neural Network for Forest Biomass estimation



NN Training phase with simulated data

SAR and Neural Network for Forest Biomass estimation



NN application phase on real data

Thank you

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*Thanks to C. Clementini and C. Vittucci of Tor Vergata Remote Sensing Group
for some contributions on slide 2 and 7.*