

## BUSTA 1

### Quesito 1

In ambito di acquisizione sismica, quali sono le più comuni tecniche per il rilevamento del rapporto segnale/rumore?

### Quesito 2

Quali sono le differenze tra le tecniche elettromagnetiche nel dominio della frequenza e nel dominio del tempo?

Since Lord Rayleigh predicted their existence (Rayleigh 1885), surface waves have attracted the interest of an increasing number of researchers embracing disciplines as diverse as solid-state physics, microwave engineering, geotechnical engineering, nondestructive testing, seismology, geophysics, material science, ultrasonic acoustics, and others. Despite their marked differences, these disciplines share the goal of exploiting surface waves propagating along the boundary of a domain to obtain information about the interior of that domain, usually expressed in terms of one or more scalar fields.

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## BUSTA 2

### Quesito 1

Nei comuni stendimenti di tomografia elettrica, cosa determina la massima profondità di esplorazione raggiungibile e la capacità di risoluzione?

### Quesito 2

Quali sono gli equipaggiamenti sismici più idonei per generare e registrare dati finalizzati all'analisi di onde superficiali?

Surface waves are appealing because they are ideal for the development of noninvasive techniques for material characterization from a very small scale, less than a millimeter (e.g., ultrasonic surface waves used to identify material defects), to a very large scale, more than a kilometer (e.g., earthquake-generated surface waves used to investigate the structure of the Earth's crust and upper mantle). At an intermediate scale, geophysicists and geotechnical engineers use surface waves for the characterization of geomaterials. The fundamental idea is the same for all these applications: to use the geometric dispersion of surface waves to infer the relevant medium properties by solving an inverse problem for parameter identification.

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