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Non-destructive nuclear measurements, from research to applications

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Non-destructive nuclear measurements are widely used in research and industry, in fields ranging from uranium exploration, nuclear reactors, process monitoring, radioactive waste characterization, nuclear accident studies, homeland security, recycling, to the final clean-up and decommissioning of nuclear facilities. Technologies like X-ray imaging, gamma-ray spectroscopy, passive neutron coincidence counting, active neutron interrogation, and neutron or photon activation analysis, are continually being improved with new radiation sources, new detectors, new electronics and new data analysis capabilities or methods. These developments are helping to meet a variety of challenges, including, but not limited to, in situ measurements in poorly controlled environments (e.g. borehole logging, nuclear decommissioning sites, old waste storage), characterization of heterogeneous radioactive waste packages with high attenuation effects, on-line process monitoring in spent nuclear fuel reprocessing, mining or recycling applications, or replacing expensive detectors with cost-effective ones. This talk will present some of these progresses, from research towards industrial applications.

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