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Neutron Activation techniques in detecting hazardous materials and cancer treatment

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The Neutron Activation Analysis (NAA) plays an exceptional role in modern nuclear engineering, especially in view of hazardous substances and threats detection. Especially in the aquatic environment, NAA has the potential to support threat detection by providing a fast and cheap tool to plan the utilization of munitions and fuel in sunken remnants of the II World War. They are a serious threat to the Navy, and the toxic substances contained in some munitions, such as combat gases, are a major environmental problem. Detecting and classifying them is still very costly. The use of neutrons is distinct from commonly used methods in that it enables the determination of not only the shape, but also the stoichiometry of the objects under investigation. In medicine, NAA may also be used to monitor the boron distribution in a patient's body during the Boron Neutron Capture Therapy. In this talk, we will present the status of practical usage of NAA and problems still to be solved in the two mentioned research fields, especially in view of the use of machine lerning algorithms.

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