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Estimation of Antineutrino Registration as a Method of Monitoring Nuclear Explosions

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As a result of nuclear weapon testing,certain markers appear,and that allows to identify a nuclear explosion.Modern technologies and methods allow hiding radioactive isotopes after an explosion or camouflage seismic signals,but the means and methods of masking antineutrinos do not exist.Antineutrino is a particle that is the only true real-time nuclear signature from a nuclear explosion that spreads long distances through different environments.In many respects, the antineutrino burst is the ideal signal for a nuclear detonation.In each nuclear explosion,a large number of neutrinos are formed,with nuclear beta-decay of fission products about 1024 neutrinos are produced per kilowatt energy release during the fission in a time interval of about 10 seconds.They are isotropically removed from the source at the speed of light.The burst of antineutrino produces is unique.Since the substance around the nuclear device does not noticeably affect the antineutrino,the signal does not depend on the environment in which the explosion occurred. We propose to build a 1 km3 detector at the South Pole for the purpose of detecting nuclear tests.The introduction of antineutrino sensors into the International Monitoring System will help to unequivocally detect the fact of nuclear weapon testing,to strengthen trust between countries and to reduce the number of inspections.

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