Global radioxenon emission inventory for 2014 by normal operational releases from nuclear power plants and medical isotope production facilities

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Global radioactivity monitoring for the verification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) includes the four xenon isotopes 131mXe, 133Xe, 133mXe and 135Xe. These four isotopes are serving as important indicators of nuclear explosions. The Kalinowski/Tuma (2009) establishes the first global radioxenon emission inventory by normal operational releases from nuclear power plants and Kalinowski/Grosch/Hebel (2014) summarizes the emissions from medical isotope production facilities, both for a generic year. The best estimate of the global emission inventory for the year 2014 was presented by Gueibe et al. (2017). That paper focusses on the year 2014 but only with annual total release values based on peer-reviewed publications. The only information specifically valid for 2014 is the operational status of known sources. In the updated emission inventory presented here the real 2014 emissions with variations over time as reported by the facility operators are used whenever available. This emission inventory can be used for source-receptor studies with atmospheric transport models and for comparing the simulated and observed radioxenon concentrations at the locations of the noble gas systems that are part of the CTBT International Monitoring System (IMS).