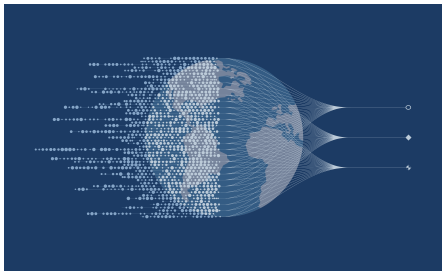

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# of two years of data from the Swedish Radioxenon Array.

The Swedish Xenon Array is a first-of-its-kind measurement system, consisting of five SAUNA QB units placed around Sweden with an inter-distance around one order of magnitude smaller than the IMS. We here present a comprehensive analysis of the first two years of data (2021-2022), where xenon background sources relevant to Sweden and northern Europe are characterized, and a comparison of the source identification power (detection, location, and characterization) of an array with an single, IMS-type xenon system (SEX63 in Stockholm). Among the results, we find that the array detects twice as many 131mXe/133Xe samples, and 35% more 133mXe/133Xe samples, compared to SEX63. A new sample association technique based on machine learning is used to auto-detect plumes. One significant benefit of the array is that it can exclude local sources within Sweden, in contrast to SEX63. 40% of the plumes are associated with the Fleurus Isotope Production Facility (IPF). We find a clear difference in the location of potential sources depending on the isotopic composition of the plumes: many of the 133mXe detections are likely associated with nuclear facilities in Russia, while the 131mXe detections mainly originates from an IPF in Poland.

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