Long-term availability of uranium resources: a bivariate statistical approach

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Title: Bivariate statistical approach to estimate availability of uranium resources in the long-term. (Poster session)

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Abstract (250-400 words):

Most recent studies on the long-term supply of uranium make simplistic assumptions on the available resources and their production costs. Some consider the whole uranium quantities in the earth's crust and then estimate the production costs based on the ore grade only, disregarding the size of ore bodies and the mining techniques. Other studies consider the resources reported by countries for a given cost category, disregarding undiscovered or unreported quantities. In both cases, the resource estimations are sorted following a rising cost trend.

In this paper, we describe a methodology based on geological environments. It provides a more detailed resource estimation and it is more versatile regarding cost modelling.

The global uranium resource estimation introduced in this paper results from the sum of independent resource estimations from different geological environments. A geological environment is defined by its own geographical boundaries, resource dispersion (average grade and size of ore bodies and their variability), and cost function. In this definition, uranium resources are considered within ore bodies. The deposit breakdown of resources is modelled using a bivariate statistical approach. In this approach, size and grade are the two random variables. This makes resource estimates possible for individual projects. Adding up all geological environments provides a repartition of all earth's crust resources in which ore bodies are sorted by size and grade. This subset-based estimation is convenient to model specific cost structures.

Keywords: Uranium resources, long-term supply.