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Synchrotron-based techniques as powerful tools for addressing fundamental issues on Soil and Food Security

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Concerns about **Food Security** and on how to address issues relevant to this global challenge are recurrent and had a worldwide landmark during *The World Food Summit*, in 1996. Meanwhile, **Soil Security** is a new concept that has been treated as crucial to guarantee Food Security only after the declaration of the *International Year of Soils*, in 2015. The assessment and proposition of actions to ensure global Food Security require continued studies that could develop better indicators to more assertively represent and solve problems related to the five dimensions of Food Security: 1) Quantity, 2) Quality, 3) Acceptability, 4) Safety, 5) Certainty/Stability. Similarly, the concept of Soil Security is also multidimensional and recognizes the importance of appropriately tackling the following dimensions: 1) Capacity, 2) Condition, 3) Capital, 4) Connectivity, 5) Codification. Concerning Food Security, light sources could help us unravel many aspects concerning the **quality** and **safety** of food and agricultural inputs, and, later, food **acceptability** as well as the evaluation of the **resilience** (sustainability) of agroecosystems. Considering Soil Security, relevant information regarding **capacity** (soil functions), **condition** (change in capacity), and **codification** (public policies and regulation) can also be obtained via resources and capabilities provided by synchrotron facilities. Our talk will discuss the use of synchrotron-based techniques for addressing issues concerning Food Security - namely food quality and safety - while also relating these aspects with relevant aspects of Soil Security that are essential to assuring the sustainability of agroecosystems.

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