

## **The LEGATO project (2017-2020): tritium transfers from the atmosphere to vegetable at hourly time-step – Field experiment and modelling approaches**

P. Laguionie<sup>1</sup>, C. Boyer<sup>2</sup>, A. Martin Garin<sup>3</sup>, E. Gagnaire-Renou<sup>2</sup>, M. Rozet<sup>1</sup>, E. Vitorge<sup>2</sup>, D. Hébert<sup>1</sup>, C. Cossonnet<sup>4</sup>, L. Solier<sup>1</sup>, M. Lamotte<sup>1</sup>, M. Morillon<sup>1</sup>, O. Cazimajou<sup>1</sup>, C. Godinot<sup>1</sup>, O.T. Bah<sup>1</sup>, J. Chardeur<sup>1</sup>, D. Maro<sup>1</sup>

<sup>1</sup>Institut de Radioprotection et de Sûreté Nucléaire (IRSN), PSE-ENV, SRTE, LRC, Cherbourg-Octeville, 50130, France

<sup>2</sup>Electricité de France (EDF), DPNT, DIPDE, D2ED, Lyon, 69458, France

<sup>3</sup>Institut de Radioprotection et de Sûreté Nucléaire (IRSN), PSE-ENV, SRTE, LR2T, Saint Paul Lez Durance, 13115, France

<sup>4</sup>Institut de Radioprotection et de Sûreté Nucléaire (IRSN), PSE-ENV, SAME, LMRE, Orsay, 91400, France

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Presenting author email: [philippe.laguionie@irsn.fr](mailto:philippe.laguionie@irsn.fr)

The LEGATO project is a 4-year project started in 2017 to study the transfers of the atmospheric tritium to vegetable in the environment in order to improve the SYMBIOSE platform used to simulate the radionuclide transfers within ecosystems and to calculate the dosimetric impact on humans. The LEGATO project combines field experiment and modelling approaches. It aims to build a new generic model to predict the Tissue Free Water Tritium (TFWT) and the Organically Bound Tritium (OBT) in leave, fruit and tuber vegetable. Experiments are conducted in a vegetable garden located at the Plateforme Technique IRSN La Hague (PTILH) from successive crops of lettuce, zucchini and potatoes. Environmental data are carried out at the hourly time step in order to take into account the dynamics of HTO concentrations in the atmosphere and the soil compartment in the formation of OBT. The hourly atmospheric HTO dynamics encountered at the PTILH site in the vicinity of Orano La Hague reprocessing plant can be extended to all sites of interest as they results from the dynamics of HTO release into the atmosphere and/or the wind direction fluctuations. The new generic model includes a vegetable growth module supplied with meteorological parameters (photosynthetically active radiation, atmospheric pressure, air and soil temperature and humidity), Farquhar's parameters (measured from a LI-6800 Portable Photosynthesis System at the leaf scale) and a leaf masking factor, and validated from CO<sub>2</sub> exchange fluxes (measured from CO<sub>2</sub> chambers at the whole plant scale) and dry masses. The LEGATO project follows the VATO project (2013-2016) that aimed to study tritium transfers to grasslands. In 2020, these two projects will have generated hourly time-step databases available to modelers to improve and validate environmental models.