

RAMPED UP!

RAMP NEWSLETTER – FALL 2025

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U.S. Nuclear Regulatory Commission
Rockville, MD

U.S. NRC RAMP website:
<https://ramp.nrc-gateway.gov/>

2025 Spring International RAMP User Group Meeting in Ottawa, Ontario, CA

This May, the Canadian Nuclear Safety Commission (CNSC) welcomed participants from around the world to Ottawa for the 2025 Spring International RAMP User Group Meeting, held in partnership with the U.S. Nuclear Regulatory Commission (NRC). For four days, experts, code developers, and regulators gathered to share knowledge, strengthen partnerships, and sharpen their skills in radiation protection, environmental safety, and emergency preparedness.

The meeting opened with a warm welcome, a land acknowledgment honoring the Algonquin Anishinaabeg people, and remarks from CNSC and NRC leadership. Attendees then dove into a robust technical symposium, with sessions covering everything from advanced reactor readiness and atmospheric dispersion modeling in extreme cold climates, to the evolving role of radiation protection in public safety.

Hands-on training formed the heart of the week, giving participants practical experience with key RAMP tools, including RASCAL, VARSKIN+, NRC-RADTRAN, Turbo FRMAC, RESRAD-Biota, and IMBA.



Panel discussion on radiological emergency response assessment by CNSC experts.

SPRING MEETING CONT.

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Beyond the technical program, the meeting fostered connection, whether during the fireside chat on small modular reactor emergency preparedness, over coffee between sessions, or at the evening networking events. The city's Canadian Tulip Festival added a vibrant backdrop, with over a million blooms brightening Ottawa's parks and canals.

By the close of the meeting, participants left with new skills, deeper professional relationships, and a renewed sense of the shared mission: to protect people and the environment through science-based decision-making. The RAMP team would like to thank all participants who made the latest meeting a success!



In person attendees in Ottawa!

TEAM HIGHLIGHTS

Medical Health Physicist – Brian N. Allen



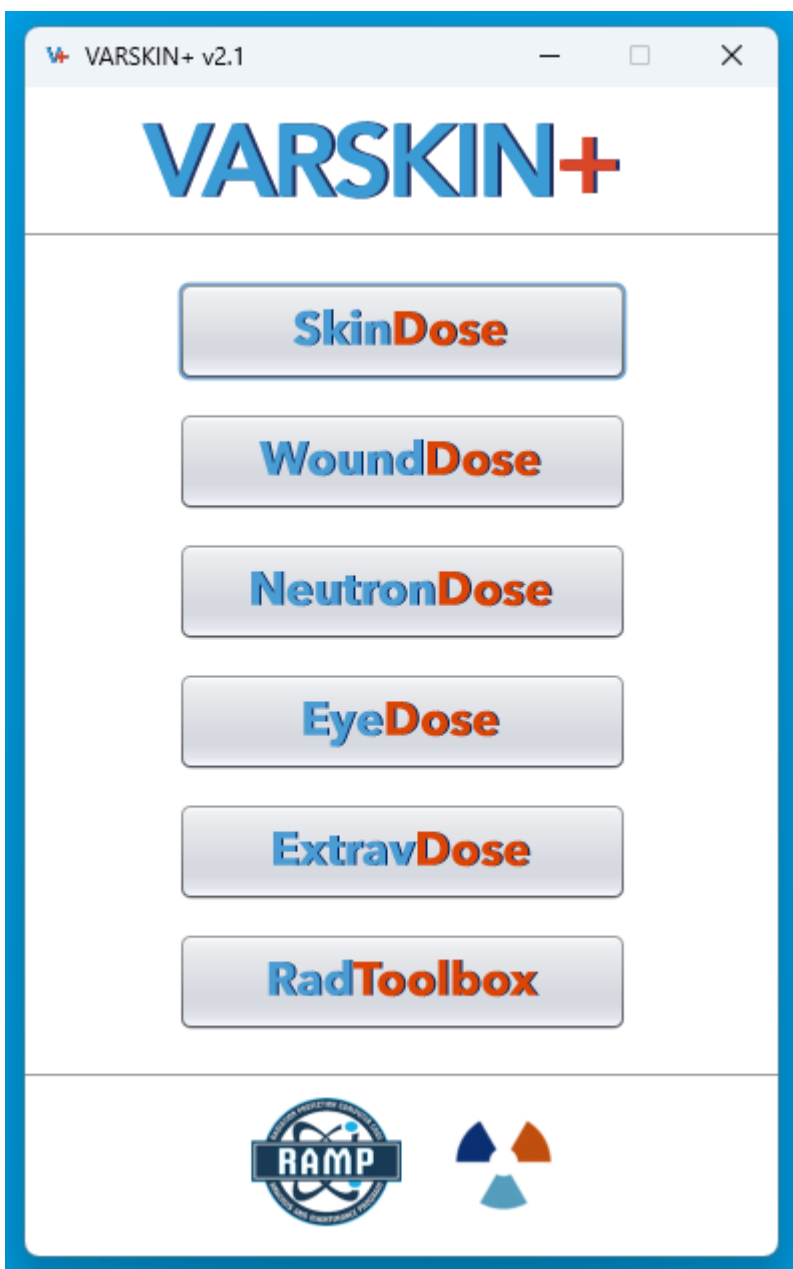
Meet Brian! He earned his bachelor's degree in chemistry and physics from the University of Central Florida (UCF) and his master's in medical physics from the University of Arizona (UofA).

After college, Brian served in the U.S. Air Force as a Diagnostic Medical Physicist and Radiation Safety Officer (RSO) at David Grant Medical Center, Travis Air Force Base. He later moved into civilian service at Walter Reed National Military Medical Center (WRNMMC) as a medical /health physicist and associate RSO.

Brian joined the NRC in December 2022 and now manages the V+, PiMAL, and IMBA computer codes. He is deeply involved in NRC's medical rulemaking efforts and provides agency-wide dosimetry analysis support.

VARSKIN+ → V+

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VARSKIN+ is to be rebranded as V+ to reflect its expanded capabilities.

VARSKIN+ will officially be rebranded as V+, marking a significant milestone in the evolution of the software beyond its original function. Originally designed to calculate occupational skin dose from radiation exposure due to hot particles or contamination, the program has expanded substantially in recent years.

In 2021, VARSKIN was upgraded to VARSKIN+ with the addition of three advanced physics models: wound dosimetry, neutron dosimetry, and eye dosimetry. Building on this foundation, the integration of the Radiological Toolbox and the Extravasation Module has further broadened the software's scope, extending its applications beyond skin dose calculations.

This rebranding reflects the program's transformation into a more comprehensive radiological assessment tool, reinforcing its value for professionals across multiple disciplines. The transition to V+ underscores the commitment to continuous innovation and expansion, ensuring that users benefit from enhanced capabilities and a forward-thinking approach to radiation dosimetry.

VARSKIN+ 2.1 central control panel with newest module for Extravasation.

SIERRA ATD

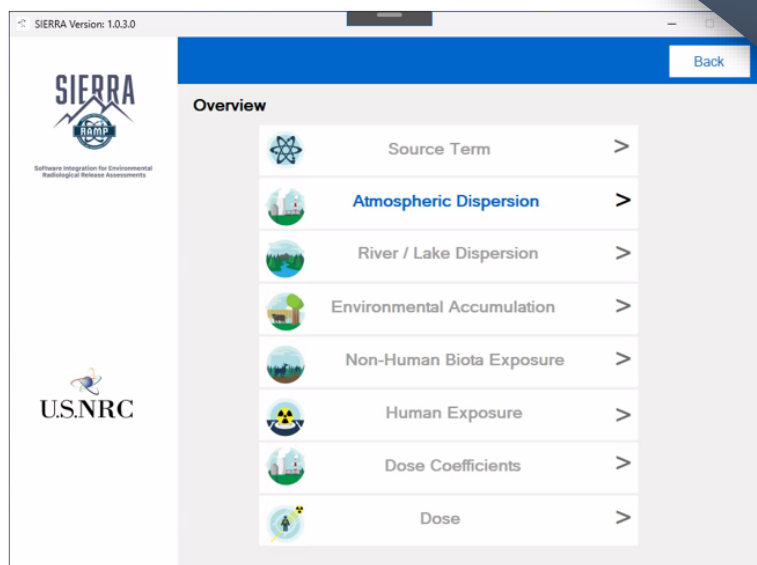
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RAMP is pleased to announce the May 2025 release of the first module in the Software Integration for Environmental Radiological Release Assessments (SIERRA) code suite. The SIERRA Atmospheric Transport and Diffusion (ATD) module release represents a significant milestone in the modernization of NRC's environmental radiological assessment tools.

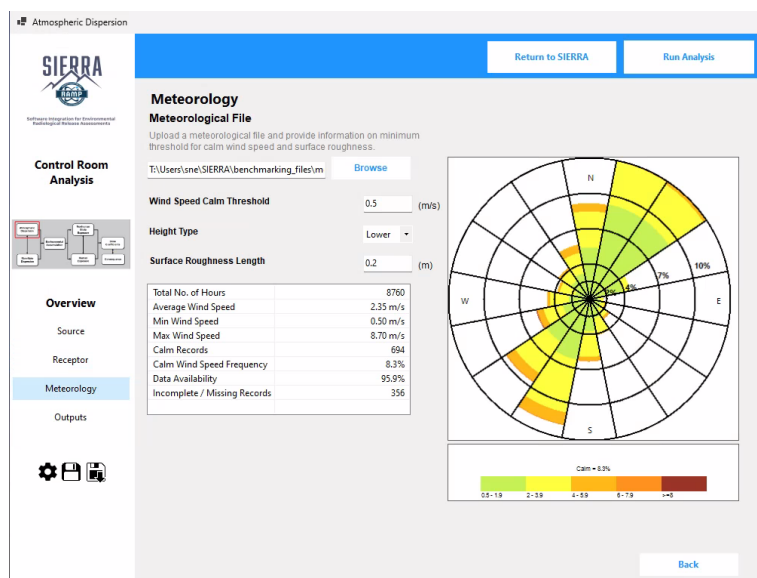
SIERRA ATD is designed to evaluate radioactive releases during both design-basis accidents (ranging from hundreds of meters to 10 kilometers) and routine effluent releases that may affect sensitive receptors and populations up to 80 kilometers away. This module consolidates the core scientific functions of three legacy NRC codes: ARCON, which calculates atmospheric concentrations in building wakes; PAVAN, which models atmospheric dispersion for accidental releases; and XOQDOQ, which evaluates meteorological conditions for routine effluent assessments. SIERRA ATD's key advancement is its hourly meteorological data processing for all three applications, improving fidelity over older joint frequency distribution methods.

Looking ahead, the next phases of the SIERRA development focus on building out two additional modules. The normal effluent source term module will begin with the integration of the GALE code, which models routine gaseous and liquid radioactive releases from Boiling Water Reactors (BWRs) and Pressurized Water Reactors (PWRs). Later updates will extend this functionality to include advanced reactor designs. In parallel, the environmental pathways module will consolidate and modernize the GASPAR and LADTAP codes, used to estimate offsite radiological doses from routine gaseous and liquid releases, respectively.

These developments mark a significant step forward in providing a modern, unified framework for environmental radiological assessments.



SIERRA central control panel with module for ATD available.



SIERRA meteorology upload page with wind rose, calms, incomplete data, all presented.

SNAP/RADTRAD

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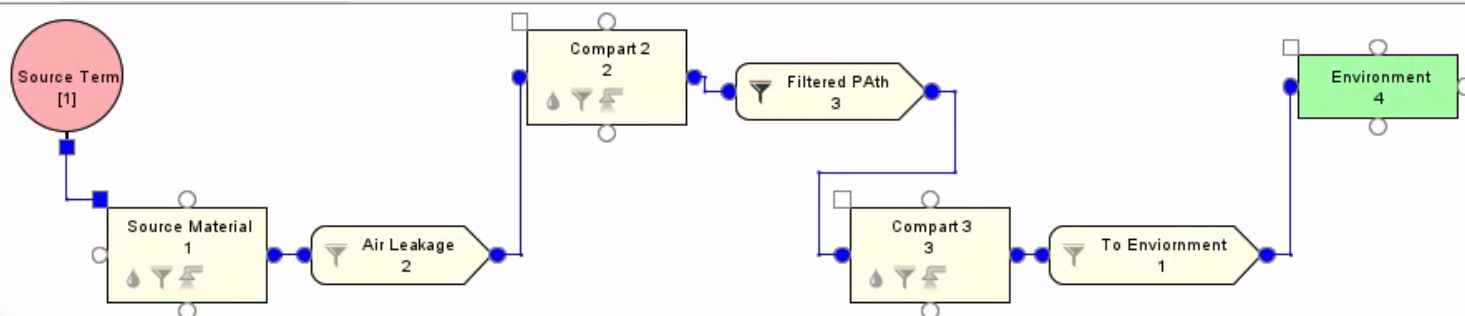
The latest update to RADTRAD, aligned with the guidance provided in Regulatory Guide 1.183 Revision 1, enhances design basis accident (DBA) calculations for both low-burnup and high-burnup light-water reactor (LWR) fuels. Key updates include revised transient release fractions, the addition of the Molybdenum chemical group, and a new model for fuel handling accident (FHA) scenarios. This version also introduces a new pathway for Boiling Water Reactor (BWR) Main Steam Line break accident types and updates the methodology for applying atmospheric dispersion factors to the low population zone (LPZ) and control room. To improve usability, a toggle option has been added to the SNAP/RADTRAD plug-in, allowing users to easily switch between Revision 0 and Revision 1 modeling parameters.

2 Hours	
Bin Upper Bound (MeV/Bq-s)	Probabilities
1.00E-04	0.00E+00
1.00E-03	5.24E-04
1.00E-02	6.52E-02
4.50E-02	1.57E-02
2.00E-01	4.92E-02
3.00E-01	1.96E-02
4.00E-01	2.60E-01
8.00E-01	2.80E-01
1.00E+00	2.64E-04
1.33E+00	6.49E-04
1.66E+00	2.40E-01
2.00E+00	6.75E-02
2.50E+00	1.13E-04
3.00E+00	4.81E-04
5.00E+00	5.77E-05
7.50E+00	0.00E+00
1.00E+01	0.00E+00

Compartment 1 Source Material

Compartment 2 Compartment 2

Compartment Source material energy bins in RADTRAD.

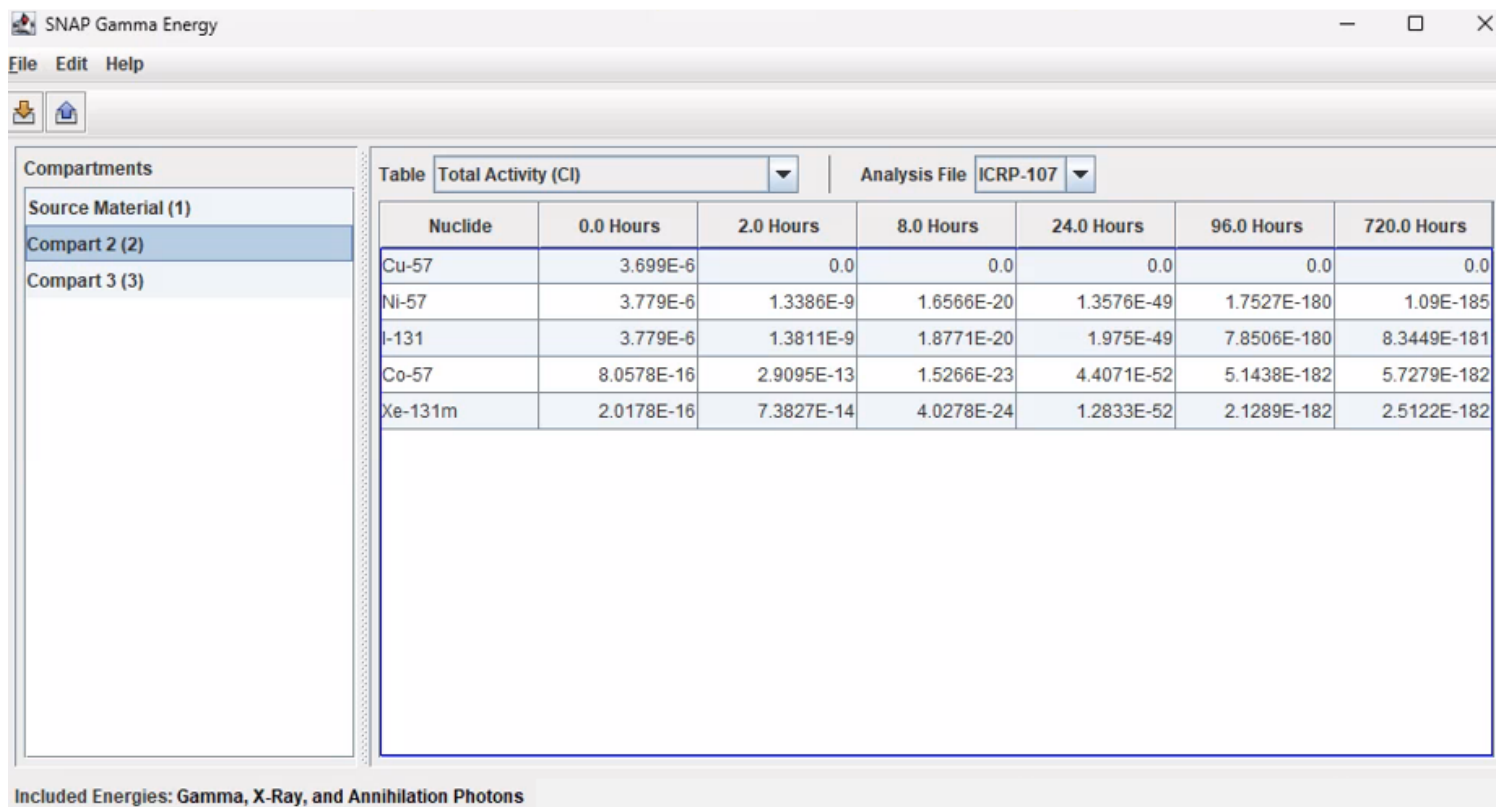


RADTRAD Default View in SNAP featuring a source term filtering thru multiple compartments before environmental release.

SNAP/RADTRAD CONT.

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Additionally, this release introduces the Gamma Energy Output Tool (GEOTool), a powerful feature that generates tabular outputs of gamma energies released over time for all compartments. These gamma energies are categorized into bins based on supplied energy bounds, enabling the creation of energy frequency distributions that can be imported into MCNP for dose calculations, with potential application for equipment qualification. Users can also choose to include decay parameters from ICRP-38 or ICRP-107, with the option to incorporate x-rays, further enhancing the flexibility of radiation dose modeling. The GEOTool has been benchmarked with ORIGEN, a widely used computer code used to model the generation, decay, and buildup of radioactive isotopes in nuclear materials.



SNAP Gamma Energy

File Edit Help

Compartments

Source Material (1)

Compart 2 (2)

Compart 3 (3)

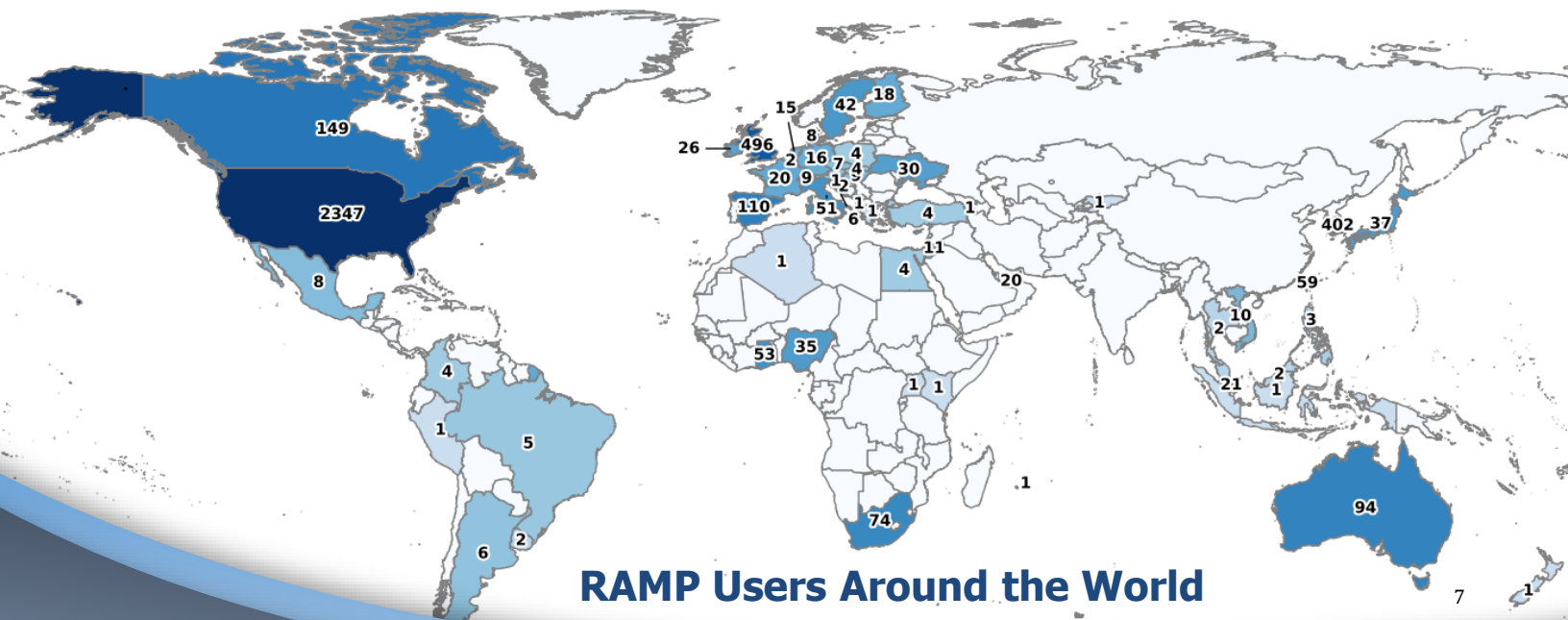
Table: Total Activity (CI) Analysis File: ICRP-107

Nuclide	0.0 Hours	2.0 Hours	8.0 Hours	24.0 Hours	96.0 Hours	720.0 Hours
Cu-57	3.699E-6	0.0	0.0	0.0	0.0	0.0
Ni-57	3.779E-6	1.3386E-9	1.6566E-20	1.3576E-49	1.7527E-180	1.09E-185
I-131	3.779E-6	1.3811E-9	1.8771E-20	1.975E-49	7.8506E-180	8.3449E-181
Co-57	8.0578E-16	2.9095E-13	1.5266E-23	4.4071E-52	5.1438E-182	5.7279E-182
Xe-131m	2.0178E-16	7.3827E-14	4.0278E-24	1.2833E-52	2.1289E-182	2.5122E-182

Included Energies: Gamma, X-Ray, and Annihilation Photons

Gamma Energy Out view inside SNAP presenting ICRP-specific total photon energies for radionuclides at timestamps across a RADTRAD job.

We would like to welcome Singapore as our newest international agreement member!

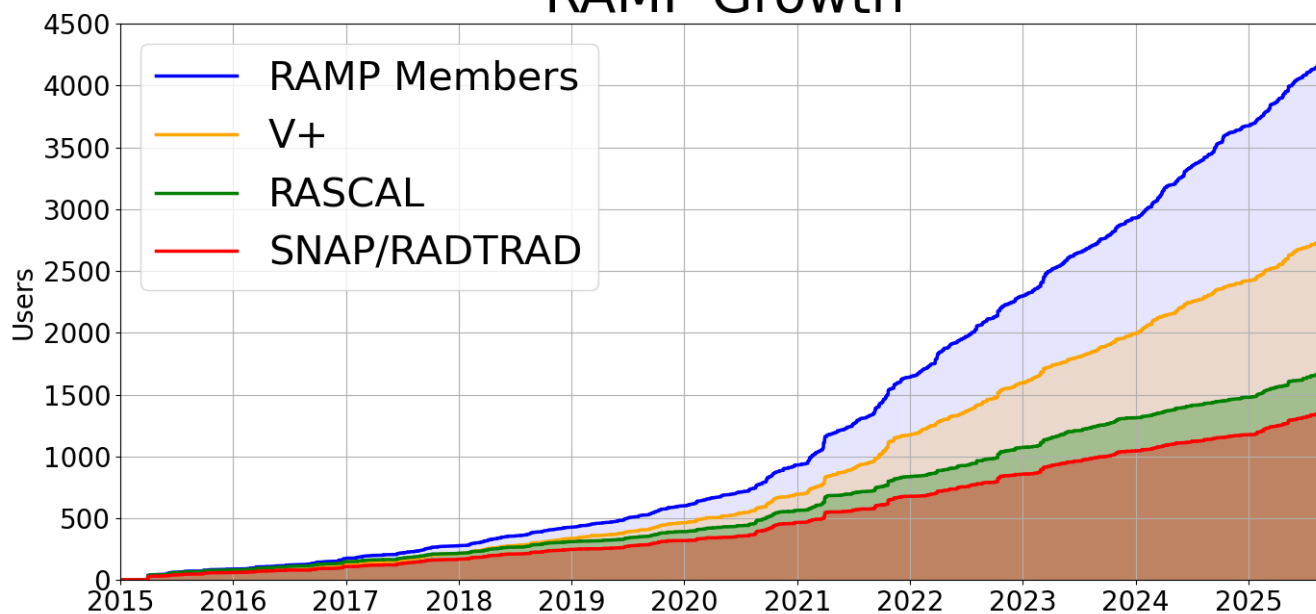


RAMP BY THE NUMBERS

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Of the 4,241 active RAMP users, most are in the United States, followed by Europe, and Asia. V+ is the most popular free code, while the most popular premium code is RASCAL, followed closely by SNAP/RADTRAD.

RAMP Growth



RAMP by Continent

