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Nova Nucleosynthesis with a New 18F(p,a) Reaction Rate¹ MICHAEL SMITH, JASON SCOTT, W. RAPHAEL HIX, DANIEL BARDAYAN, ERIC LINGERFELT, ORNL Physics Division, RAYMOND KOZUB, Tennessee Technologival Univ., CARL BRUNE, Ohio Univ., SUMNER STARRFIELD, Arizona State Univ. — The long-lived radionuclide ¹⁸F is synthesized in nova outbursts and its decay may serve as an observational tracer of the explosion mechanism. Because the ${}^{18}F(p,\alpha){}^{15}O$ reaction is the dominant destruction mechanism for ${}^{18}F$, the flux of gamma rays from ¹⁸F decay is very sensitive to the rate of this reaction. A revised ${}^{18}F(p,\alpha){}^{15}O$ rate was determined from recent ORNL measurements of ${}^{1}H({}^{18}F,p){}^{18}F$ and ${}^{2}H({}^{18}F,p){}^{19}F$, combined with a reanalysis of archival ${}^{15}N(\alpha,\alpha){}^{15}N$ data. We used this new rate in nova element synthesis calculations and compared new predictions of the synthesized abundance 18 F (and other nuclides) to that obtained using the two most recent (p,α) rates. We used a post-processing approach with temperature and density histories of 28 zones of ejected material determined from separate hydrodynamics calculations. The implications for satellite observations of novae will be discussed. These calculations were performed and visualized with the Computational Infrastructure for Nuclear Astrophysics, an online suite of codes available at **nucastrodata.org**.

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Michael Smith ORNL Physics Division

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