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Study of ^{57}Zn β-delayed proton emission and its impact on the ^{56}Ni rp-process waiting point MANSI SAXENA, Institute of Nuclear and Particle Physics, Department of Physics and Astronomy, Ohio University — A strong bypass circumventing ^{56}Ni waiting point and diverting the rp-process flow through the path ^{55}Ni(p,γ)^{56}Cu(p,γ)^{57}Zn(β^+)^{57}Cu(p,γ)^{58}Zn has been proposed [1]. The ^{56}Ni(p,γ) and ^{56}Cu(p,γ) reaction rates calculated with the recently measured mass of ^{56}Cu [2] show that the rp-process flow can redirect around the ^{56}Ni waiting point. However, the dominant source of uncertainty regarding the strength of this bypass is the β^+-delayed proton emission decay branch of ^{57}Zn, having a present estimate of 78$\pm$17% [3]. We measured β-delayed proton emission of ^{57}Zn at the National Superconducting Cyclotron Laboratory using implantation in a DSSD surrounded by a clover array for p-γ-coincidences. We substantianlly improved the precision for the proton-emission branching ratio and identified new γ-ray transitions that each correspond to the exotic β-γ-p decay mode. These results, along with the impact on the rp-process flow will be discussed

[1]W.-J. Ong, et. al, Phy. Rev C **95** 055806 (2017).
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[3]B. Blank et. al, Eur. Phys. J. A **31** 262-272 (2007).

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