Laser wavelength tuning for (Anti) Hydrogen and Muoniumresonant ionization

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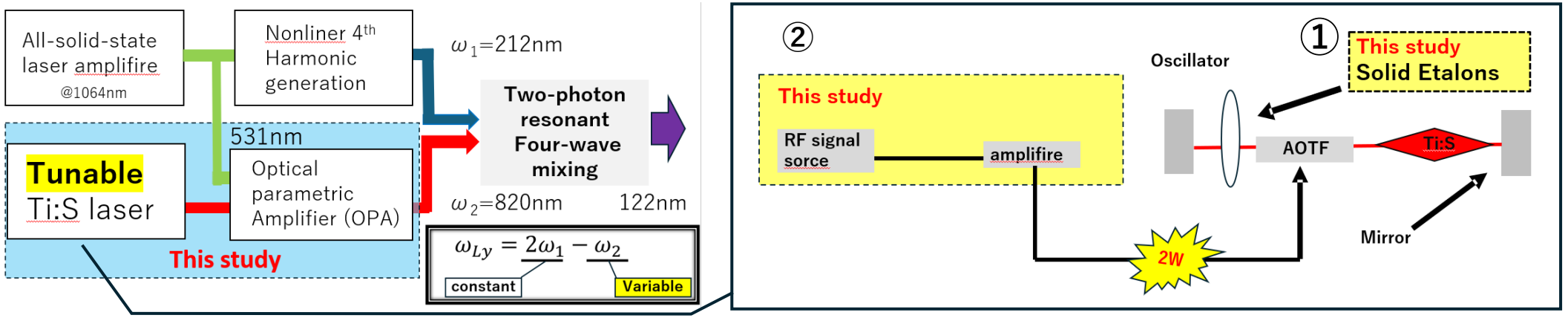
Purpose of this study

To improve the efficiency of ultra-slow muon production by precisely tuning the laser's spectral width to match the target's Doppler broadening.



How

①Narrowing Linewidth with Solid Etalons:

We simulated that inserting solid etalons into the Ti:S laser resonator can significantly narrow the spectral width.

②Stabilizing Output with RF Feedback System:

We developed a new feedback system using a Raspberry Pi to suppress RF power fluctuations and stabilize the laser output.

concludion

We improved the laser system to achieve stable VUV output with controlled linewidth, which is essential for ultra-slow muon production.