Table 7: Rubidium 87 Dipole Matrix Elements, Saturation Intensities, and Resonant Scattering Cross Sections.

$D_2(5^2S_{1/2} \longrightarrow 5^2P_{3/2})$ Transition Dipole Matrix Element	$\langle J = 1/2 \Vert er \Vert J' = 3/2 \rangle$	4.227 52(87) ea_0 3.584 24(74) $\times 10^{-29}$ C·m
Effective Dipole Moment, Saturation Intensity, and Resonant Cross Section ($F = 2 \rightarrow F' = 3$) (isotropic light polarization)	$d_{\mathrm{iso,eff}}(F = 2 \rightarrow F' = 3)$	2.042 09(42) ea_0 1.731 35(36) $\times 10^{-29}$ C·m
	$I_{\mathrm{sat(iso,eff)}}(F = 2 \rightarrow F' = 3)$	3.577 13(74) mW/cm^2
	$\sigma_{0(\mathrm{iso,eff})}(F = 2 \rightarrow F' = 3)$	1.356 456 704 270(31) $\times 10^{-9}$ cm^2
Effective Far-Detuned Dipole Moment, Saturation Intensity, and Resonant Cross Section (D_2 line, π-polarized light)	$d_{\mathrm{det,eff,D_2}}$	2.440 76(50) ea_0 2.069 36(43) $\times 10^{-29}$ C·m
	$I_{\mathrm{sat(det,eff,D_2)}}$	2.503 99(52) mW/cm^2
	$\sigma_{0(\mathrm{det,eff,D_2})}$	1.937 795 291 814(44) $\times 10^{-9}$ cm^2
Dipole Moment, Saturation Intensity, and Resonant Cross Section $\vert F = 2, m_F = \pm 2 \rangle \rightarrow \vert F' = 3, m'_F = \pm 3 \rangle$ cycling transition ($\sigma^{\pm}$-polarized light)	$d_{(m_F = \pm 2 \rightarrow m'_F = \pm 3)}$	2.989 31(62) ea_0 2.534 44(52) $\times 10^{-29}$ C·m
	$I_{\mathrm{sat}(m_F = \pm 2 \rightarrow m'_F = \pm 3)}$	1.669 33(35) mW/cm^2
	$\sigma_{0(m_F = \pm 2 \rightarrow m'_F = \pm 3)}$	2.906 692 937 721(66) $\times 10^{-9}$ cm^2
$D_1(5^2S_{1/2} \longrightarrow 5^2P_{1/2})$ Transition Dipole Matrix Element	$\langle J = 1/2 \Vert er \Vert J' = 1/2 \rangle$	2.9931(20) ea_0 2.5377(17) $\times 10^{-29}$ C·m
Effective Far-Detuned Dipole Moment, Saturation Intensity, and Resonant Cross Section (D_1 line, π-polarized light)	$d_{\mathrm{det,eff,D_1}}$	1.7281(12) ea_0 1.4651(10) $\times 10^{-29}$ C·m
	$I_{\mathrm{sat(det,eff,D_1)}}$	4.4876(31) mW/cm^2
	$\sigma_{0(\mathrm{det,eff,D_1})}$	1.081 257 000 480(25) $\times 10^{-9}$ cm^2