Erratum: Noncyclic Berry phase and scalar Aharonov-Bohm phase for the spin-redirection evolution in an atom interferometer [Phys. Rev. A 86, 022105 (2012)]

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We would like to add the condition which Eq. (4) holds and Eq. (4′) for the other condition, and using them, Fig. 7 is revised as follows:

Equation (4) holds for $0 \leqslant \theta \leqslant \pi/2$ and for $\pi/2 \leqslant \theta \leqslant \pi$

$$\gamma(\theta,\phi) = -m \begin{cases} 4\pi - 2\sin^{-1}\left(\frac{\sin(\phi/2)}{\sqrt{1+\tan^2\theta\cos^2(\phi/2)}}\right) - \phi\cos\theta, & 0 \leqslant \phi \leqslant \pi, \\ 2\left[\pi + \sin^{-1}\left(\frac{\sin(\phi/2)}{\sqrt{1+\tan^2\theta\cos^2(\phi/2)}}\right)\right] - \phi\cos\theta, & \pi \leqslant \phi \leqslant 2\pi. \end{cases} \tag{4′}$$
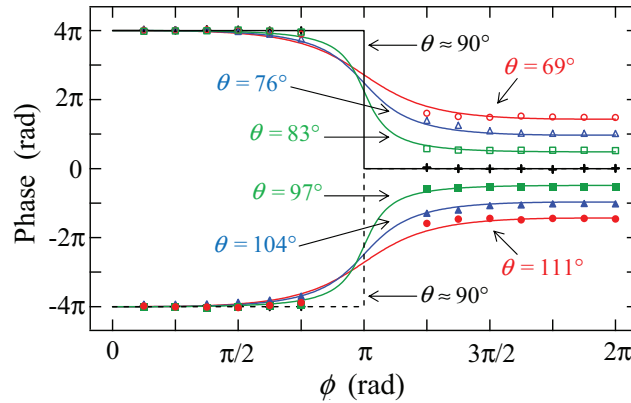

FIG. 7. (Color online) Observed phase for various θ vs rotation angle. For $\phi < \pi$, the experimental values are shifted in 4π for $\theta < \pi/2$ and in -4π for $\theta > \pi/2$. The solid lines are theoretical curves calculated for noncyclic Berry's phase defined by a geodesic gauge.