Riis *et al.* Reply: We respond to a Comment by Bay and White[1] on our recent publication[2] which reported a new limit for the possible anisotropy of the velocity of light. The real problem is how best to discuss a generalization of the postulates of the standard theory of relativity to include one-way effects. A completely general and dynamical test theory has not yet been developed, and so we have used the framework of Mansouri and Sexl[3] which can serve as a useful interface between experiments and the analytical or conceptual results to be derived by others from a fundamental viewpoint. Analysis[4] of our two-photon experiment within the theory of Mansouri and Sexl shows that only for $\alpha+\frac{1}{2}\neq 0$ is an anisotropy expected. Bay and White have taken two examples, apparently different, but both in fact correspond to Lorentz invariance as they postulate time dilation and Lorentz contraction to be present. We agree that the velocity anisotropy of interest is not contained in a Lorentz-invariant theory.

The measured two-photon resonance corresponds to simultaneous absorptions of two counterpropagating photons via a real intermediate level. When the laser frequency and transition are specified, we may calculate (for whatever synchronization condition we may assume) the velocity in the laboratory frame of atoms resonant on the lower transition. The elegance of the experiment is that this same velocity is used by the atom to "calculate" for its upper transition the Doppler shift with respect to the counterrunning beam. If the laser frequency has been well chosen, this second excitation will bring the atom to the third (and in our experiment, highest) state of interest, the one from which fluorescence is observed. The apparatus was configured so that the location of the resonance controlled the laser frequency while maximizing the intensity of the resonance ensured that the atomic beam velocity distribution was centered on the value giving stepwise excitation. Thus we are mainly freed from the troubling synchronization issues raised by Bay and White.

By the nature of the two-photon absorption, the two first-order-sensitive transitions take place at the same space-time point and with the same atom velocity. However, we are not initially obliged to believe that the two counterpropagating light beams travel with the same speed. The experimental question was whether the Doppler shifts were time dependent with a sidereal period, since the Earth's rotation changes the direction of the light beams relative to the direction of motion of the laboratory in the supposed "preferred frame" offered by anisotropy of the 3-K background. The experimental answer is that at the level of $\delta c/c \sim 3\times 10^{-9}$ there is no effect. A straightforward analysis of the Mössbauer rotor experiment[5] gives $\delta c/c \sim 3\times 10^{-10}$, but the interpretation is less transparent as that experiment does not make use of the first-order Doppler effect.

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