Zu *et al.* Reply: The comment by Amselem *et al.* [1] misinterprets the logic and assumption of our experiment [2]. Note that for tests of quantum contextuality, so far no experiment can be done in a loophole-free and device-independent manner. We need to make some reasonable assumptions in experiments to rule out the noncontextual hidden variable models. What we have assumed in our experiment is about the functioning of some simple linear optical devices: half wave plates (HWPs) and polarization beam splitters (PBSs). Basically, we assume that a HWP, set at an angle θ, transforms the polarization H, V of the incoming light field by $H \rightarrow \cos(2\theta)H + \sin(2\theta)V$, $V \rightarrow -\sin(2\theta)H + \cos(2\theta)V$ and a PBS transmits the light component in H polarization and reflects its component in V polarization [2]. This knowledge does not require an assumption of formalism of quantum mechanics and can be regarded as basic experimental facts or laws about these well-calibrated linear optical devices. The linear transformation of these optical modes is apparently independent of the intensity of the incoming light and holds in classical optics as well as in quantum cases.

A schematic setup of our experiment is shown in Fig. 1. The mode transformer composed of the PBSs and the HWPs link the modes A_i, A_j, A_k right before the light detectors with the modes 0, 1, 2, which are prepared in the same state for different experimental trials. The light detector behaves like a black box, which gives binary measurement outcomes (click or no click) for the incoming field or mode. We assume the detectors are identical and exchangeable as is the case in experiments. For a test of contextuality, we just need to make sure that the observable A_i before the detector D_i, expressed in terms of the modes 0,1,2, remains the same when we change the observable A_j to $A_{j'}$ before the other detector for measurement of the correlations [3]. With a knowledge of the functioning of the HWPs and the PBSs in the mode transformer, one can easily check that this is the case in our experiment when we tune the angles of the HWPs. For some trials of the experiment, we swap the labeling of the modes 2 and 0 (1). Again, with a knowledge of the functioning of the HWPs and PBSs, we are still measuring the same observable, which, expressed in term of the relabeled modes 0,1,2, is under the same system state.

Note that the functioning of these linear optical devices are also assumed in previous experiments on test of quantum contextuality. For instance, in Ref. [4], the real experimental setup is shown in Fig. 3 there. To reduce the real setup to the schematic setup shown in Fig. 1 there for a test of quantum contextuality, one has to assume that the PBSs and the HWPs set at right angles transform the optical modes as they are supposed to function. So this assumption is not particular to our experiment at all.

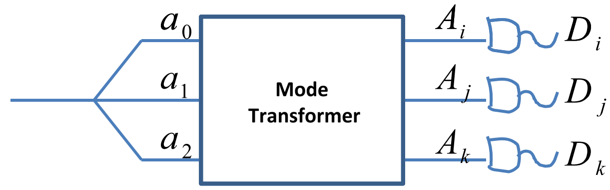

FIG. 1 (color online). Illustration of the schematic experimental setup.

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