

Observing longitudinal inversion with a vehicle's rear-view mirror



Figure 1. (Left.) The front side of the sticker viewed from behind the car. **Figure 2.** (Centre.) The back side of the sticker viewed from inside the car. **Figure 3.** (Right.) The appearance of the sticker when viewed in the rear-view mirror from the driver's seat.

There has been a surprising amount written in physics education journals about the nature of the image in a plane mirror [1–7]. The main issue addressed is the apparent right-to-left inversion of the image relative to the object. This topic has even attracted the attention of philosophers and psychologists (see for example [8,9]). Clearly, it is not

immediately obvious that the image is inverted in the longitudinal direction (front–back), but not laterally (left–right or up–down). A good example of this phenomenon should help convince students that the image in a plane mirror is only inverted front-to-back.

Text on a transparent sheet has been suggested as

an object for exploring the image in the laboratory [3,7]. A semi-transparent sticker on the rear window of a car is another suitable object which students are likely to encounter in their everyday experience. The sticker should be observed in the three ways pictured above. Figure 1 is a picture of a sticker taken from behind the car, as it is intended to be seen. The view from the driver's seat when facing backward is shown in figure 2. Finally, figure 3 is a picture of the sticker's image in the car's rear-view mirror. Even though the mirror is facing the back side of the sticker, the image in the mirror looks as if it were taken from the front side as in figure 1. This clearly demonstrates the longitudinal inversion produced by the plane mirror.

References

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