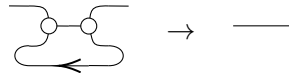


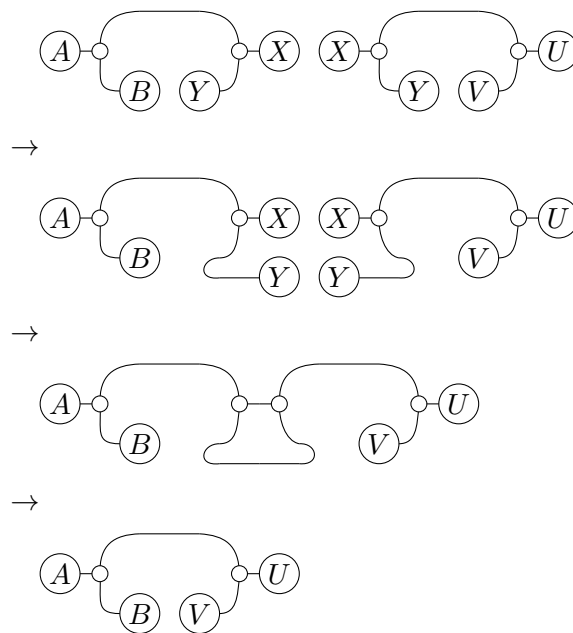
# COMPOSING OPTICS WITH FEEDBACK

ELENA DI LAVORE AND MARIO ROMÁN

We employ the graphical calculus of the monoidal bicategory of profunctors, as in [Rom20]. Consider a *category with feedback* as in [KSW02]. That means we have a feedback operator as follows.



We can join two optics using the following composition.



Associativity can be checked from the axioms of feedback using internal diagrams. A unit for this composition can be obtained in particular cases such as compact closed categories.

## REFERENCES

- [KSW02] Piergiulio Katis, Nicoletta Sabadini, and Robert F. C. Walters. Feedback, trace and fixed-point semantics. *ITA*, 36(2):181–194, 2002.
- [Rom20] Mario Román. Open diagrams via coend calculus, 2020.