

# A Note about Modal Symmetries

Ezequiel Orbe, Carlos Areces, and Gabriel Infante-López

FaMAF, Universidad Nacional de Córdoba, Argentina

**Abstract.** In this paper we show how permutation of literals can be used to define symmetries for modal formulas in clausal form. We show that the symmetries of a modal formula  $\varphi$  preserve inference: if  $\sigma$  is a symmetry of  $\varphi$  then  $\varphi \models \psi$  if and only if  $\varphi \models \sigma(\psi)$ . Hence, a modal theorem prover that has access to the symmetries of the input formula, can use them during search to cheaply derive symmetric inferences (e.g., as is done during clause learning in propositional SAT). We also present a mechanism to efficiently compute symmetries using graphs automorphisms, and preliminary empirical results showing that symmetries appear in many cases in both randomly generated and hand-tailored modal formulas.