

# Tied monoids

- Arcis D.<sup>a</sup>,
- Juyumaya J.<sup>b</sup>

## **Abstract**

We construct certain monoids, called tied monoids. These monoids result to be semidirect products finitely presented and commonly built from braid groups and their relatives acting on monoids of set partitions. The nature of our monoids indicate that they should give origin to new knot algebras; indeed, our tied monoids include the tied braid monoid and the tied singular braid monoid, which were used, respectively, to construct new polynomial invariants for classical links and singular links. Consequently, we provide a mechanism to attach an algebra to each tied monoid; this mechanism not only captures known generalizations of the  $bt$ -algebra, but also produces possible new knot algebras. To build the tied monoids it is necessary to have presentations of set partition monoids of types A, B and D, among others. For type A we use a presentation due to FitzGerald and for the other type it was necessary to built them. © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

## **Author keywords**

braids; Knot algebras; Set partitions; Tied braids; Tied structures