

## **ABSTRACT**

BOŠTJAN GABROVŠEK

We introduce bonded knots, oriented knots together with a set of properly embedded colored arcs. Such knots can be used to topologically model protein structures, where the knots correspond to closed protein backbone chains and the bonds correspond to non-local interactions between the amino acids. The bond colors encode the interaction type (disulphide bridges, ionic bonds,...) that may appear in the conformation of the protein. We will define two invariants of colored bonded knots, namely the HOMFLYPT skein module and a generalization of Kauffman's  $T$  invariant for spatial graphs.