Knot Concordance and Twisted Blanchfield Forms

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Abstract. In this talk I will recall the notion of knot concordance as defined by Fox and Milnor, which asks whether a knot in S3 bounds a disk in 4 space D4. The work of Casson and Gordon involved a two stage obstruction theory which depends on the intersection form of a 4-manifold. This has been generalised by the work of Cochran-Orr-Teichner. I shall discuss an obstruction theory which is intrinsically 3-dimensional, using Blanchfield linking forms with coefficients twisted using metabelian representations of the knot group. These linking forms obstruct null-concordance. We then describe an algorithm to construct the symmetric chain complex of the universal cover of a knot exterior, and then use this to make calculations of the twisted Blanchfield forms.