

Modular Representations of Profinite Groups

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Our aim is to transfer several foundational results from the modular representation theory of finite groups to the wider context of profinite groups. We are thus interested in profinite modules over the completed group algebra $k[[G]]$ of a profinite group G , where k is a finite field of characteristic p .

We define the concept of relative projectivity for a profinite $k[[G]]$ -module. We prove a characterization of finitely generated relatively projective modules analogous to the finite case with additions of interest to the profinite theory. We introduce vertices and sources for indecomposable finitely generated $k[[G]]$ -modules and show that the expected conjugacy properties hold - for sources this requires additional assumptions. Finally we prove a direct analogue of Green's Indecomposability Theorem for finitely generated modules over a virtually pro- p group.

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