Hyperelliptic group

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By definition, the so-called hyperelliptic group G is simply the fundamental group of a hyperelliptic curve extended by its hyperelliptic involution. Equivalently, it is the group generated by n involutions $r_1, \dots, r_n$ with the defining relation $r_1 \dots r_n = 1$, where n is even. Denote by T the usual Teichmüller space of all curves, i.e., the Hitchin component of representations of surface group in $PO(2,1)$, and by H, the Teichmüller space of hyperlliptic ones.

We show that to an arbitrary curve one can associate a couple of hyperelliptic ones so that T is fibred twice over H providing an embedding of T into $H \times H$.

Also, we discuss the problem of existance of a Hitchin component of representations of G in $PO(2,2)$.