1060-57-253 **Maciej Niebrzydowski** and **Jozef H. Przytycki*** (przytyck@gwu.edu), Department of Mathematics, George Washington, Monroe Hall, Room 240 2115 G Street NW, Washington, DC 20052. *The second quandle homology of the Takasaki quandle of an odd abelian group is an exterior square of the group.*

M.Takasaki introduced the notion of kei (involutive quandle) in 1942. His main example was the quandle of an abelian group $T(G)$ with $a * b = 2b - a$, which we call a Takasaki quandle. We prove that if G is an abelian group of odd order then the second quandle homology $H_2^Q(T(G))$ is isomorphic to $G \wedge G$ where $\wedge$ is the exterior product. In particular, for $G = Z_k^n$, k odd we have $H_2^Q(T(Z_k^n)) = Z_k^{n(n-1/2}$. We start our proof by constructing Cayley graph and Cayley 2-complex of $T(G)$ in such a way that the first homology of the complex is the second homology of $T(G)$. We choose a spanning tree for the Cayley graph and contract it. The homological result is the group $Z(G \times G)$ divided by relations $[x,x] = 0$ (this corresponds to the fact that in quandle homology we nullify degenerate elements), $[0,x] = 0$ (elements of a chosen spanning tree are equal to zero) and $[x,z] + [z,y] = [x, z-y+x] + [z-y+x, y]$. Then we prove that for G generated by 2 elements the main result holds, in particular that $[x,y] = -[y,x]$. After some algebraic manipulations we obtain generally $G \wedge G$. Our result can be directly applied to classical links as 2-(co)cycles give link invariants. They also can be used to produce new nontrivial quandles. (Received March 31, 2010)