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*Correction*

# Correction to: Hamiltonian and Algebraic Theories of Gapped Boundaries in Topological Phases of Matter

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**Correction to: Commun. Math. Phys. 355, 645–689 (2017)**
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There were two errors in the original publication. First, the term $B^K$ in Eq. (2.20) was not well-defined in the case of non-normal subgroups $K$; however, we found out that both the vertex terms $A^K$ and the plaquette terms $B^K$ are in fact redundant in Eq. (2.23) given the edge terms. The text from Eqs. (2.19–2.23) should read:

Let us now define some new projector terms, as in Ref. [10]:

$$L^K(e) := \frac{1}{|K|}\sum_{k\in K}\left(L_+^k(e) + L_-^k(e)\right), \tag{0.1}$$

$$T^K(e) := \sum_{k\in K} T_+^k(e) \tag{0.2}$$

The definitions of $L^k$ and $T^k$ for Eqs. (0.1–0.2) are based on Eqs. 2.1–2.4.

Following Ref. [10], we can now define the following Hamiltonian:

$$H_{(G,1)}^{(K,1)} = \sum_e \left(\left(1 - T^K(e)\right) + \left(1 - L^K(e)\right)\right) \tag{0.3}$$

With this definition, it is no longer necessary to emphasize whether vertices/plaquettes/edges along the borders of gapped boundaries are contained in the hole; for simplicity, one may assume that the hole consists of all edges along and within the border.

Second, there is an error in Theorem 2.12. The theorem should read:

The original article can be found online at https://doi.org/10.1007/s00220-017-2960-4.

**Theorem.** *Let* $(T, R)$ *and* $(C, \pi)$ *be given elementary excitations in the boundary and bulk, respectively. The term* $Y_\tau^{(T,R);(\mathbf{u_2},\mathbf{v_2})}$ *has a nonzero coefficient in the decomposition of* $F_\tau^{(C,\pi);(\mathbf{u_1},\mathbf{v_1})}$ *(for some quadruple* $(\mathbf{u_1}, \mathbf{v_1}, \mathbf{u_2}, \mathbf{v_2})$*) if and only if the following two conditions hold:*

*(1) The intersection* $C \cap T$ *is nonempty. When this condition holds, it is always possible to choose a double coset representative* $r_T$ *that is also in* $C$*. We assume that such a choice is made, and this assumption is important because Eq. (0.7) will give different results otherwise.*

*(2) There exists an* $x \in G$ *such that the following is true: Let* $x \triangleright \pi$ *denote the representation of* $xE(C)x^{-1}$ *obtained from* $\pi$ *where* $y$ *acts as* $x^{-1}yx$*. Let* $\rho_{x\triangleright\pi}$ *be the (possibly reducible) representation of the subgroup* $(xE(C)x^{-1}) \cap K^{r_T}$ *resulting from the restriction of* $x \triangleright \pi$ *to* $(xE(C)x^{-1}) \cap K^{r_T}$*; let* $\rho_R$ *be the representation of the same subgroup formed by restricting* $R$*. Decompose* $\rho_{x\triangleright\pi}$*,* $\rho_R$ *into irreducible representations of* $(xE(C)x^{-1}) \cap K^{r_T}$*:*

$$\rho_{x\triangleright\pi} = \oplus_\sigma n_\sigma^{x\triangleright\pi} \sigma \tag{0.4}$$

$$\rho_R = \oplus_\sigma n_\sigma^R \sigma \tag{0.5}$$

*There must exist some irreducible representation* $\sigma$ *of* $(xE(C)x^{-1}) \cap K^{r_T}$ *such that* $n_\sigma^{x\triangleright\pi} \neq 0$ *and* $n_\sigma^R \neq 0$*.*

*In particular, let* $X(C)$ *be a set of representatives of the double cosets* $K\backslash G/E(C)$*. For given* $(C, \pi)$ *let us write the decomposition after condensation as*

$$(C, \pi) = \oplus n_{(T,R)}^{(C,\pi)} (T, R). \tag{0.6}$$

*Then, we have*

$$n_{(T,R)}^{(C,\pi)} = \sum_{\substack{x \in X(C) \text{ s.t. } x r_c x^{-1} \in T \\ \sigma \in ((xE(C)x^{-1}) \cap K^{r_T})_{ir}}} n_\sigma^R n_\sigma^{x\triangleright\pi} \tag{0.7}$$

*Furthermore, these coefficients imply that the two sides of Eq. (0.6) will always have the same quantum dimensions.*