

FINITELY GENERATED SHIFT INVARIANT SPACES WITH EXTRA INVARIANCE NEAREST TO  
OBSERVED DATA

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Let  $m, \ell \in \mathbb{N}$ ,  $M$  be a closed subgroup of  $\mathbb{R}^d$  containing  $\mathbb{Z}^d$  and  $F = \{f_1, \dots, f_m\} \subset L^2(\mathbb{R}^d)$ . We study the problem of finding the shift invariant space  $V$  of length less or equal to  $\ell$  which is also  $M$ -invariant such that  $V$  is “closest” to the functions  $F$  in the sense that

$$V = \operatorname{argmin}_{V' \in V_M^\ell} \sum_{j=1}^m \|f_j - P_{V'} f_j\|^2,$$

where  $V_M^\ell$  is the set of all shift invariant spaces  $V'$  of length less or equal to  $\ell$  which are also  $M$ -invariant, and  $P_{V'}$  is the orthogonal projection on  $V'$ .

Also we consider this problem for a particular set of translation invariant spaces.

*Joint work with Carlos Cabrelli (Universidad de Buenos Aires, CONICET, Argentina).*