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Characterization of inert actions on periodic points. Part II

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1 Introduction

We will prove the following theorem stated in [KRW3], thereby completing the third and final step in characterizing inert actions on finite sets of periodic points of a primitive subshift of finite type (X_A, σ_A) constructed from a nonnegative integral matrix A. See [KRW1, KRW2, KRW3] for definitions and notation.

SGCC Theorem. *Assume A is primitive and that $h \geq 2$ is a positive integer such that for every integer $s \geq h$ there is at least one periodic point of period exactly s. Let ψ be in $\mathrm{Aut}(\sigma_A|P_h)$. Let $gy_k = GY_k(\psi)$ for $2 \leq k \leq h$, and let $os_k = OS_k(\psi)$ for $1 \leq k \leq h$. Assume that the sign-gyration-compatibility-condition*

$$gy_k + \sum_{i>0} os_{k/2^i} = 0$$

holds for $2 \leq k \leq h$. Then there is an element ζ in $\mathrm{Inert}(\sigma_A)$ such that

$$GY_k(\zeta) = gy_k \quad \textit{for } 2 \leq k \leq h$$

$$OS_k(\zeta) = os_k \quad \textit{for } 1 \leq k \leq h$$

While the method of proof is somewhat similar to the one used in proving the GY Theorem and OS Theorem of [KRW3], a new technique called the Enlargement Method is introduced and may have further application. The reader should review the Introduction and Section 2 of [KRW3]: the Introduction gives the main results and applications, and Section 2 contains basic material on polynomial graphs (variable length coding). It is not necessary to go through all details of the proofs of the GY and OS Theorems to understand this paper.

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