▶ ASSAF RINOT, *Diamond, non-saturation, and weak square principles*.

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We report on results from [1] and [2] concerning the effect of weak square principles to guessing principles. Let Refl_λ denote the assertion that every stationary subset of $\left\{\alpha < \lambda^+ \mid \mathrm{cf}(\alpha) = \mathrm{cf}(\lambda)\right\}$ reflects. A corollary to the results that we shall discuss in our talk is the following.

THEOREM. *For a singular cardinal λ:*

1. $\mathrm{GCH} + \mathrm{Refl}_\lambda + \square_\lambda^* \Rightarrow \Diamond_{\lambda^+}^*$;
2. $\mathrm{GCH} + \mathrm{Refl}_\lambda + \mathrm{SAP}_\lambda \not\Rightarrow \Diamond_{\lambda^+}^*$;
3. $\mathrm{GCH} + \mathrm{Refl}_\lambda + \mathrm{SAP}_\lambda \Rightarrow \Diamond_S$ *for every stationary $S \subseteq \lambda^+$*;
4. $\mathrm{GCH} + \mathrm{Refl}_\lambda + \mathrm{AP}_\lambda \not\Rightarrow \Diamond_S$ *for every stationary $S \subseteq \lambda^+$*.

In addition, we prove that SAP_λ (and hence $\square_\lambda^*$) implies that $\mathrm{NS}_{\lambda^+} \restriction S$ is non-saturated for every $S \subseteq \lambda^+$ that reflects stationarily often. We prove that the failure of a guessing principle introduced by Džamonja and Shelah is equivalent to the failure of Shelah's strong hypothesis. We also provide two (negative) answers to a question of König, Larson and Yoshinobu; one in the presence of GCH, and one in its absence.

[1] M. GITIK AND A. RINOT, *The failure of diamond on a reflecting stationary set*, **preprint**, 2009.

[2] A. RINOT, *A relative of the approachability ideal, diamond and non-saturation*, **preprint**, 2009.