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

\textbf{Theorem.} For a singular cardinal $\lambda$:

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

In addition, we prove that $\text{SAP}_\lambda$ (and hence $\Box^*_\lambda$) implies that $\text{NS}_{\lambda^+} \upharpoonright S$ 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 the other in its absence.

\textbf{References}