1147-13-326 **Kohji Yanagawa*** (yanagawa@kansai-u.ac.jp). *When is a Specht ideal Cohen-Macaulay?* Preliminary report.

Let $R = K[x_1, ..., x_n]$ be a polynomial ring over a field K of characteristic 0, and λ a partition of n. For a Young tableau T with shape λ, we have its *Specht polynomial* $f_T(x) \in R$. The symmetric group S_n acts on the K-vector space U_λ spanned by $\{ f_T(x) \mid T \text{ is a Young tableau with shape } \lambda \}$. An S_n-module U_λ is called a *Specht module*, and U_λ's give a complete list of irreducible representations of S_n.

So let us consider the *ideal* $I^{\mathrm{Sp}}_\lambda := (U_\lambda) \subset R$. If $R/I^{\mathrm{Sp}}_\lambda$ is CM, then λ is of the form either $(a, 1, \dots, 1)$, (a, b), or $(a, a, 1)$. First, $R/I^{\mathrm{Sp}}_{(a,1,\dots,1)}$ can be seen as a determinantal ring, and is CM (a joint work with Junzo Watanabe). If $\lambda = (a, b)$ or $(a, a, 1)$, then we have

$$\sqrt{I^{\mathrm{Sp}}_\lambda} = \bigcap_{F \subset \{1,\dots,n\},\, \#F = a+1} (x_i - x_j \mid i, j \in F).$$

A result of Etingof et al. states that $R/\sqrt{I^{\mathrm{Sp}}_\lambda}$ is CM *in these cases*. Our main result is the following.

Theorem. $R/I^{\mathrm{Sp}}_{(a,b)}$ is reduced, and hence CM.

The case $\lambda = (a, a, 1), a \geq 5$ is open. (Received January 19, 2019)