Some results on cyclic coverings over normal surface singularities,

- from the viewpoint of the relation with pencil of curves-

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Let (X, o) be a normal surface singularity and h a reduced element of $\mathfrak{m}_{X,o}$. Let (X_n, o) be the n-fold cyclic covering of (X, o) defined by $z^n = h$. In this talk, we explain some results on (X_n, o). For example, we study $\operatorname{mult}(X_n, o)$ (multiplicity), subsingularities sequences, pencil genus and maximal ideal types. For $\operatorname{mult}(X_n, o)$, we obviously see " $\operatorname{mult}(X_n, o) \leqq n \cdot \operatorname{mult}(X, o)$" although it is too rough. Studying the maximal ideal cycles and embedding points of the pull-back of the maximal ideal $\mathfrak{m}_{X,o}$, we obtain the concrete value of $\operatorname{mult}(X_n, o)$. From it, we can prove that $\operatorname{mult}(X_n, o)$ takes constant value for sufficiently large n.