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Anar Akhmedov and **Sumeyra Sakalli*** (saka1008@umn.edu). *Deformation of Singular Fibers of Genus 2 Fibrations and Small Exotic Symplectic 4-Manifolds.*

In 1963, Kodaira classified all singular fibers in pencils of elliptic curves, and showed that in such a pencil, each fiber is either an elliptic curve or a rational curve with a node or a cusp, or a sum of rational curves of self-intersection -2. Later Namikawa and Ueno gave geometrical classification of all singular fibers in pencils of genus two curves. In their constructions they used algebro-geometric techniques. In this talk, I will give topological descriptions of certain singularity types in the Namikawa-Ueno's list by presenting Lefschetz pencils of genus two curves in the Hirzebruch surfaces precisely. I will also discuss 2-nodal spherical deformation of certain singular fibers of genus two fibrations. Then by using them I will provide constructions of exotic, minimal, symplectic 4-manifolds homeomorphic but not diffeomorphic to $\mathbb{C}P^2 \# 6(-\mathbb{C}P^2)$, $\mathbb{C}P^2 \# 7(-\mathbb{C}P^2)$ and $3\mathbb{C}P^2 \# k(-\mathbb{C}P^2)$ for $k = 16, \dots, 19$. This is a joint work with Anar Akhmedov. (Received September 20, 2017)