M16a Magnetic structures formed by twisted emerging magnetic field and their features on the Sun（捻れを持つ浮上磁場が形成する磁場構造とその太陽面における特徴）

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It has been suggested that magnetic field forms slender flux tubes below the photosphere. These flux tubes have some twist in order to keep the integrity of the flux tube rising through the convection zone; otherwise vigorous convective motions easily disrupt flux tubes before they emerge into the photosphere.

In this talk we focus on the twist of an emerging flux tube and see how the twist affects magnetic structures formed above the photosphere. We assume two cases where magnetic field composing the flux tube is differently twisted. We use MHD simulations to follow the flux tube emerging from the subphotosphere into the corona. Based on the topological evolution of emerging field lines we define 'outer field lines' and 'inner field lines' and show the physical state of these field lines, including the shape of field line and distribution of physical quantities along the field line, such as flow, gas density and current density. A comparison between the weakly twisted case and highly twisted case leads us to obtain a physical insight into how the twist of subphotospheric field contributes to forming magnetic structures above the photosphere, such as sigmoids and filaments.