

## Characteristics of ESR and TL of natural quartz from river bed sediments

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The sediment provenance would give important information on the erosion processes, uplift of the mountains and so on, suggesting the environments at the time of sediment transportation. The sediment is made of fine grains such as sand and silt. When a new procedure for clarifying provenance of such sediments is established, it will be useful to elucidate the provenance of sediments in the geohistorical environments, which may occasionally be related to stream piracy, regional tectonic setting and/or the environment changes of the hinterland.

There have been already some Electron Spin Resonance (ESR) and luminescence studies on sediment provenance. The intensity of the E<sub>1</sub>' center in quartz is shown to be a useful parameter to investigate the provenance of aeolian dust as well as of sediments [1][2]. The crystallinity index (CI) in combination with ESR is employed to discriminate two different sources of eolian dust in the sediment core taken from the Japan Sea [3]. Quartz of four distinct origins can be distinguished using impurity (Al, Ti-Li, Ti-H, Ge) centers observed after beta irradiation [4]. Shimada and Takada (2008) and Shimada et al. (2013) also show that the Al, Ti-Li and E<sub>1</sub>' center signal intensities from the natural quartz are useful to distinguish the sediment provenance [5][6]. Volcanic quartz is reported to emit stronger red thermoluminescence (TL) than blue one whereas plutonic quartz does vice versa [7]. Quartz of eolian origin transported from China can be distinguished from volcanic quartz originated in Japanese tephra by looking at TL color of quartz grains [8].

In this study, we report the characteristics of ESR and TL of quartz taken from present river bed sediments, to discuss the possibilities of identifying sediment provenance.

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