TERRESTRIAL IMPACT STRUCTURES OF TWO TARGET MATERIALS AND TEXTURES.
Yasunori Miura, Yamaguchi University, Yamaguchi 753-0074, Japan (dfb30@yamaguchi-u.ac.jp)

Introduction: Impact structures on Earth are classified by typical impact crater (on land) and broken and buried impact structure (of soft targets on ocean-bottom impacts) [1]. The present paper is to elucidate various impact structures based on target materials and textures [1-4].

Two types of terrestrial impact structures: Impact structures on Earth are classified by two types of target materials and textures as follows (shown in Table 1):
1) Type 1: Impact crater structures formed at all hard target rocks of igneous and sedimentary continental crust show this type remained at recent lands (Barringer, Ries, Wolf Creek, Henbury, and Gosses Bluff). Ejected way of this type is opposite side [5].
2) Type 2: Impact structures formed at soft target materials of seawater sedimentary and limestone basement rocks is easily buried and broken by plate-movements, which should be studied by drilled and physical explorations. The type 2 is further divided into sea-bottoms (s) and lands (c) by remained impact remnants. Sea-bottom type 2s can be explored due to younger formation, but ocean-land type 2c remained at present lands uplifted is classified more at lowlands remained broken structures (Acraman Lake, Sudbury, and Takamatsu), and at highland remained near the mountain summit (Santa Fe) or mountain side (Akiyoshi, Japan) [1-4]. The Santa Fe impact structure explored in 2011 fall, is type 2c, because we found limestone breccias with impact-related carbon-bearing materials by our FE-ASEM works. Similar impact-related carbon-bearing grains are found at 960m depth of Takamatsu drilled core [2-4].

Application: Extraterrestrial surfaces of waterless Moon and planets with void-rich texture of spoils and breccias are related with the present type 2c lowlands and highlands, which volatile tiles produced by impacts are considered to be stored at the interiors for local material state changes [1, 4].

Table 1. Two types of terrestrial impact craters.

| 1) Type 1: Impact crater on hard target rock (Earth land) |
| 2) Type 2: Broken and buried impact structure on soft soils and breccias (remained at two lands) |

Summary: Terrestrial impact structures are divided into impacts on hard rock (type 1) and soft materials (type 2) remained at lowlands (type 2s) and highlands (type 2c), where carbon-bearing micro-grains are material state change indicators at broken and buried impact structures.