IMPACTS ON WATER AND WATERLESS SURFACES ON EARTH, THE MOON AND MARS. Y. Miura, Yamaguchi University,Yamaguchi, Yamaguchi, Japan 753-0074. yasmiura50@gmail.com.

Introduction: Impact craters on rocky target of continental surface on Earth have been discussed exceedingly with many researches [1]. On the other hand, impacts on ocean water planet are difficult to be analyzed on global fluids to basement rocks with evaporated water and remained rocky sediments easily disappeared original crater structure, where the remained crater structure are broken and/or buried in sea-basement covered by later sediments.The main purpose of the present paper is to elucidate new interpretation of impacts on global fluid-solid targets of Earth planet compared with various solid targets of Earth and other celestial bodies of the Moon and Mars [1-4].

Previous interpretation of impact on solid rock: Impact craters on rocky solid-targets of continental surface on Earth have been analyzed exceedingly by many indicators of topography (the bowl-shaped depression with circular shape etc.), geophysics (gravity anomaly etc.), geochemistry (meteoritic elemental etc.) and geo-mineralogy (shocked quartz and textures etc.). This is case of impact process developed mainly shock-wave process with various solid targets (with different compositions) continuously developed from impact point to the remained crater-shape structure on Earth's lands and the waterless Moon and Mars [1-3].

Characteristics of solid impacts on land rocks: Main characteristics on rocky impacts are largely changed formation times, locations and chemical compositions of silica-rich or -bearing solid rocks of the continents on active and water-planet Earth. In fact, mixed and remelted younger rocks show complicated data related with impact process of vaporizing and melting conditions as shown in Fig.1 [1-3]

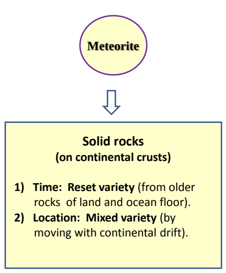

Fig.1. Schematic diagram of various time and location data on meteoritic impacts on solid rocks of active planet Earth [1-3].

Characteristics of ocean-water impacts: Major characteristics of ocean-water impacts are crater structure and rock dating data of ocean-floor basements with carbon-bearing compositions due to Earth system.

Prompt ocean-craters through global ocean are easily broken the original circular structure by floor movements with plate-tectonics as shown in Fig.2 [3, 5].

Broken impact-structure on ocean impacts: Ocean impact signatures on active water-planet are 1) aggregated impact-blocks on volcanic islands (Japan), 2) broken to buried impact-structure with carbon, and 3) enrichment of meteoritic elements at metallic mines on mixed islands (Japan) or continental blocks [5, 6].

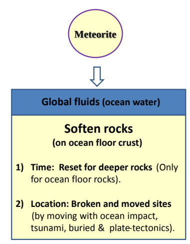

Fig.2. Schematic diagram of various time and location data on meteoritic impacts on fluid-solid rocks of water- planet Earth [5, 6].

Application of waterless extraterrestrial bodies: Impacts on solid-targets on waterless extraterrestrial bodies are overlapped on the basement rocks with ejected fragments with carbon-bearing grains [4]. The overlapped impact structures are mixed data of formation ages, compositions and minerals on waterless celestial bodies by the surface and drilled samplings.

Summary: Present summary is as follows. (1) Previous study of impact structures is based on land rocks of active water-planet Earth. (2) Impact structures on ocean-water floor are largely broken from original crater structures on ocean floors different with the land impacts. (3) Ocean impact signatures are aggregated blocks on mixed islands with enrichments of meteoritic elements on the islands or continental blocks. (4) Extraterrestrial impacts are completely overlapped to the solid interior required the detailed drilled samplings.

References: [1] French B.M., Short N.M. (1968): Shock Metamorphism of Natural Materials, 644pp. [2] Ernst W.G. (1990): The Dynamic Earth (Col. Univ. Press), 280pp. [3] French B. (1998): Traces of catastrophe (LPI Contribution 954), 120 pp. [4] Heiken G. H., Vaniman D.T., French B.M. (1991): Lunar source book (Cambridge Univ. Press), 632pp. [5] Miura Y. et al. (2000): LPS XXXI, abstract#2096. [6] Miura Y. et al. (2006): LPS XXXVII, abstract#1239.