



Yukimarimo at Dome C, Antarctica

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Natural frostballs called “yukimarimo” were observed at at Dome C, Antarctica, during the winter of 2014. Frostballs have spheroidal or lightly oblate form. Four cases of the yukimarimo were observed in the period April - August. The characteristics concerning their sizes, density, distribution over the surface varied for different cases. The diameters ranged from several millimetres to 120 mm, the density ranged from 15 to 60 kg/m³. The heaviest one weighted 14 g and had a diameter of ≈ 90 mm. The initial “material” from which they formed resembles candy floss or fluff. In one case, only the initial stage of the small-yukimarimo formation was observed; the further development was interrupted. The meteorological conditions observed during the yukimarimo were not particular. The near-surface temperature varied between -70° and -60° C. Winds favouring to the yukimarimo formation were low, but not less than 2 m/s. A two-step mechanism of their formation and development is assumed: 1) at the initial stage, an electrostatic attraction favours the clumping of ice crystals to form some ice mass resembling floss structured in spherical pieces; 2) some pieces of ice floss are rolled by the wind and collect more ice crystals and increase in size like to a tumbleweed. Special comprehensive studies of electrical properties of the frost during the initial stage are necessary. Videos of moving yukimarimo at different stages of their formation are available.