18–22 September 2017, Pula, Croatia
ECSS2017-17-1

The rough Palagruža sailing ride – Analysis of a marine ball lightning event

Alexander Keul (1) and Gerhard Diendorfer (2)

(1) Salzburg, Psychology, Salzburg, Austria (alexander.keul@sbg.ac.at), (2) head of OVE-ALDIS lightning detection and research, Vienna, Austria (g.diendorfer@ove.at)

Gerhard Duering, a retired Austrian transporter of 64 years and leisure yachtsman, reported his cross-Adriatic sailing ride of August 16, 2015, from Vieste, Province Foggia, Italy, to Komiža, Vis, Croatia. He was single skipper on his Bavaria 46 sailing yacht and acquired only sketchy weather information. At his northward passage of Palagruža Island, Croatia, around 11 A.M., he encountered thunderstorms with showers, heavy gusts, and frequent CG lightning. He continued, escaped a direct lightning strike, but observed CG flashes into the sea around his boat with multiple ball lightning. The mast of his yacht is grounded, but the witness felt danger and a fear of death.

The witness described a similar process at every nearby CG flash: 20 or more luminous balls that spurted up after impact and fell down to the sea surface. The soundless objects were white, under 10 cm, and lasted less than 5 seconds. Few CG flashes near his yacht produced balls that reached the deck. They were opaque, disappeared in contact with the white fiberglass reinforced plastic material, and left no residue or damage there.

ESTOFEX reported an upper low in the SE Mediterranean causing unusual, quasi-stationary weather conditions for the time of the year. The UK Met Office Fax Chart August 16 0UTC showed a cold front over northern Italy and a shallow Adriatic low. Croatian weather service DHZM Split warned about „isolated thunderstorms, ..in the southern part of the Central Adriatic local gusts of SW wind 30-40 knots.“ Vis, also Hvar and Split airports, reported thunderstorms. Local lightning data from the EUCLID network recorded the activity maximum between 13:30 and 14:20 CEST with 1,448 flashes in a 40 km radius around Palagruža. The yacht's navionics was switched off, so an exact match is not possible. Nine probable CG flashes had -9.5 to -32.2 kA.

Evaluating the case, it has to be considered there is an order of magnitude difference between the satellite-recorded frequencies of land and sea CG lightning and that there are fewer marine observers. The Palagruža witness was near the sea surface and saw details not visible from the bridge of a big liner or car ferry. Balls from CG lightning into seawater resemble the experimental „Gachina discharge“, a luminous spherical plasmoid created by an electric discharge near the water surface which lasts under 0.5 seconds.