

1 Solid-state Batteries

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5 **1 Title** **1**

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11 **Abstract**

12 **1 Title**

13 In September 2021, a significant jump in seismic activity on the island of La
14 Palma (Canary Islands, Spain) signaled the start of a volcanic crisis that still
15 continues at the time of writing. Earthquake data is continually collected and
16 published by the Instituto Geogrfico Nacional (IGN). ...

17 **1.1 Introduction**

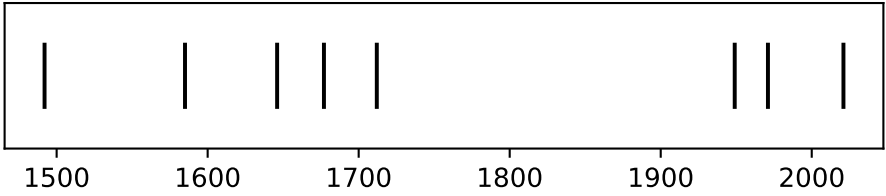


Figure 1: Timeline of recent earthquakes on La Palma

18 Based on data up to and including 1971, eruptions on La Palma happen every
19 79.8 years on average. Studies of the magma systems feeding the volcano, such
20 as [1], have proposed that there are two main magma reservoirs feeding the

21 Cumbre Vieja volcano; one in the mantle (30-40km depth) which charges and in
 22 turn feeds a shallower crustal reservoir (10-20km depth). Eight eruptions have
 23 been recorded since the late 1400s (Figure 1). Data and methods are discussed
 24 in Section 1.3. Let x denote the number of eruptions in a year. Then, x can be
 25 modeled by a Poisson distribution

$$p(x) = \frac{e^{-\lambda} \lambda^x}{x!} \quad (1)$$

26 where λ is the rate of eruptions per year. Using Equation 1, the probability of
 27 an eruption in the next t years can be calculated.

Table 1: Recent historic eruptions on La Palma

Name	Year
Current	2021
Teneguía	1971
Nambroque	1949
El Charco	1712
Volcán San Antonio	1677
Volcán San Martin	1646
Tajuya near El Paso	1585
Montaña Quemada	1492

28 Table 1 summarises the eruptions recorded since the colonization of the islands
 29 by Europeans in the late 1400s.

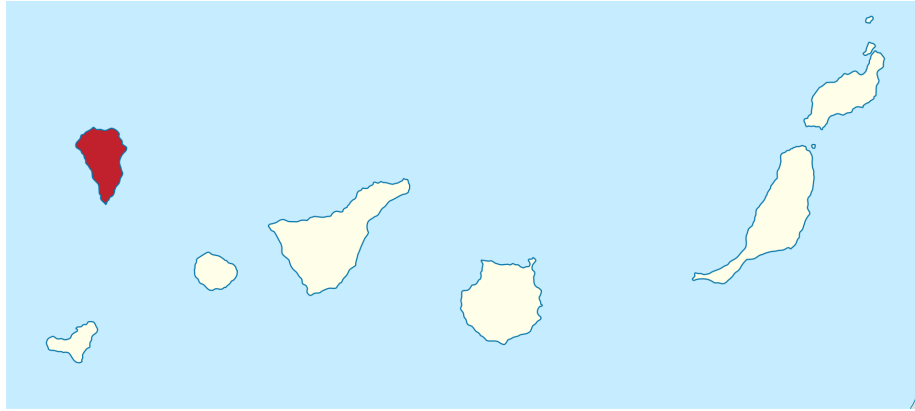


Figure 2: Map of La Palma

30 La Palma is one of the west most islands in the Volcanic Archipelago of the
 31 Canary Islands (Figure 2).

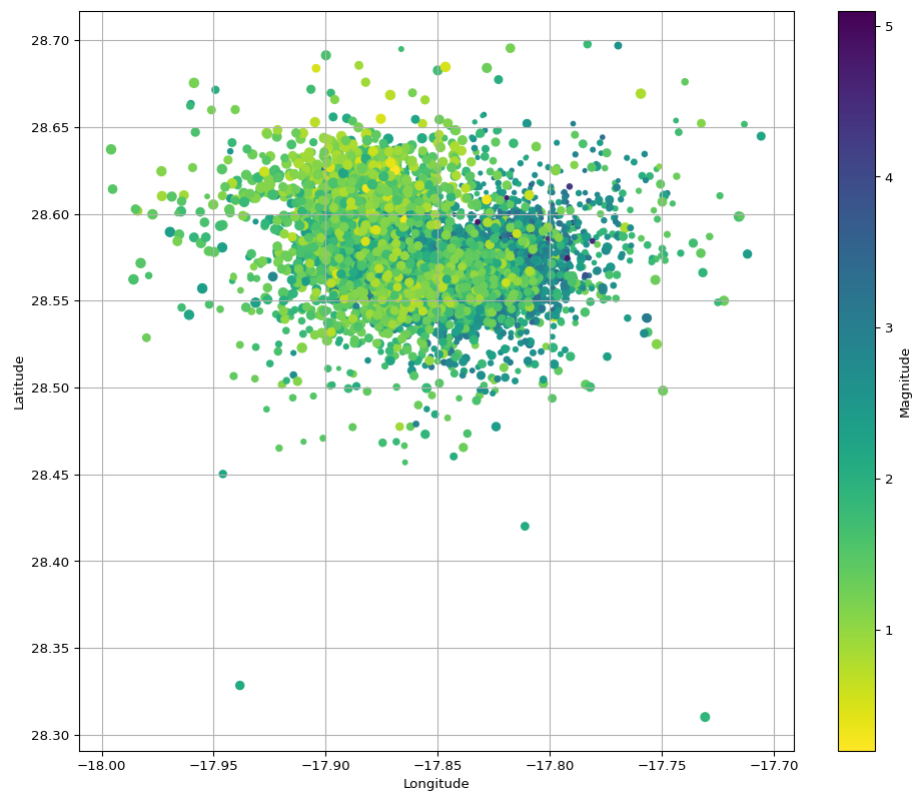


Figure 3: Locations of earthquakes on La Palma since 2017.

32 Figure 3 shows the location of recent Earthquakes on La Palma.

33 **1.2 Methods**

34 **1.3 Results and Discussion**

35 **1.4 Conclusion**

36 **References**

- 37 [1] P. Albertus, V. Anandan, C. Ban, N. Balsara, I. Belharouak, J. Buehner-Garrett, Z. Chen, C. Daniel, M. Doeff, N.J. Dudney, B. Dunn, S.J. Harris, S. Herle, E. Herbert, S. Kalnaus, J.A. Libera, D. Lu, S. Martin, B.D. McCloskey, M.T. McDowell, Y.S. Meng, J. Nanda, J. Sakamoto, E.C. Self, S. Tepavcevic, E. Wachsman, C. Wang, A.S. Westover, J. Xiao, T. Yersak, Challenges for and pathways toward Li-metal-based all-solid-state batteries, ACS Energy Letters 6 (2021) 1399–1404. <https://doi.org/10.1021/acsenergylett.1c00445>.