

100 Years of Point-Coincidences. Adventures and Misadventures of the Point-Coincidence Argument

Marco Giovanelli

In his 1916 review paper on general relativity Einstein made a celebrated, yet somewhat cryptic claim that all physical measurements amount to a determination of space-time coincidences. John Stachel has successfully labeled this argument as ‘point-coincidence argument’. A century has passed since the argument made its first appearance in a published writing, which is a good occasion to take stock of it. The argument had immediately great resonance, but — with the relevant exception of Leiden physicists (Ehrenfest, Lorentz, De Sitter) who were in epistolary contact with Einstein — it was mostly misunderstood. The paper will argue that it was only at the turn of the 1960s, in connection with search for ‘observables’ in general relativity, that Peter G. Bergmann (Einstein’s former assistant in Princeton) used the term ‘coincidence’ anew in a way that was much closer to Einstein’s intentions. Resorting to Bergmann’s generalization of the notion of ‘coincidence’, the paper will explore the possibility of taking Einstein’s claim more seriously than, with few exceptions, it is usually done: general relativistic space-time should be identified with the set of all possible ‘coincidences’.