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*) As stated in the text, the modes of the cognition to Fig. 6.6.3, long wavelengths play the central role in the Casimir effects. A recurrent property found in condensed matter (phonons of much lower frequency ω_{ip}) than plasmons (ω_{ep}), nuclei ($\hbar\omega_2$, $\hbar\omega_{CDR} \ll \hbar\omega$), proteins (in this connection see Michelelli et al (2001), (2002), (2004), Hamacher (2010) and refs.

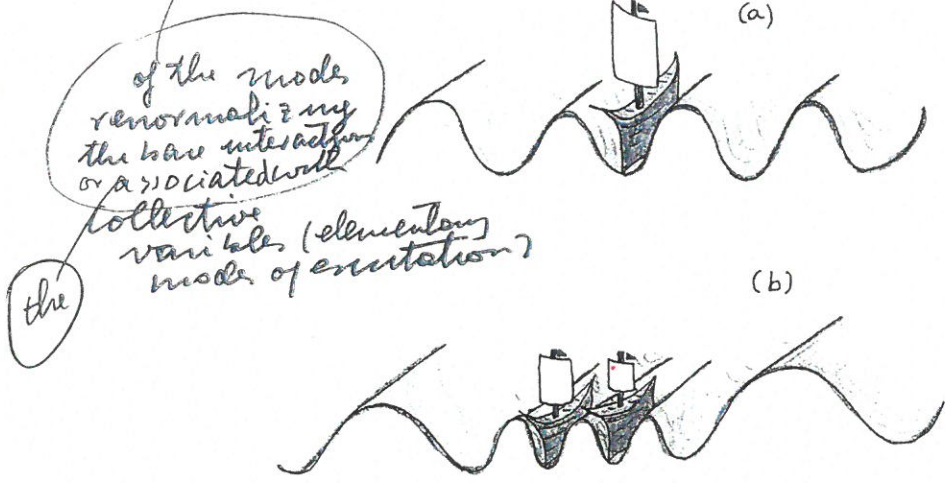


Figure 6.G.2: (Color online) Schematic representation of the behaviour of an isolated ship at sea in a situation of no wind but of strong swell (a), and of two ships close by in similar conditions (b).

circumstances, two vessels at close distance, attracted each other. This in keeping with the fact that the rigs of the rolling ships became often entangled leading to disaster. It was not until quite recently⁶⁸ that a quantitative understanding of the phenomenon (based on knowledge of similar quantal effects) was achieved, providing evidence that the old tale was true. Only waves with wavelength smaller than the separation of the ships can exist between them. In the region of sea extending away from the ships to the horizon, waves of any wavelength can exist (see Fig. 6.G.2(b)). This fact results into an imbalance between the forces exerted by the internal (between ships) waves, in favour of that exerted by the external waves, leading to a net attraction. Quantum mechanical, such an effect is known as the Casimir effect⁶⁹.

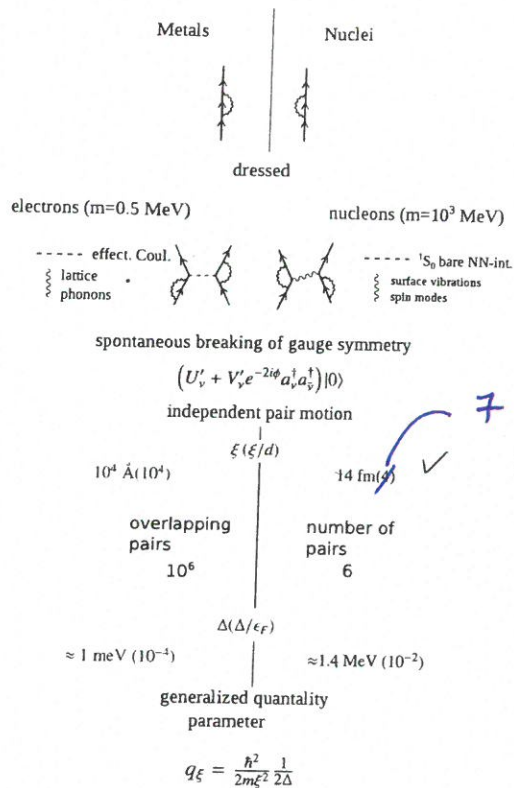
Two conducting neutral plates at very small distances, of the order of the micrometers, attract each other, due to the imbalance in electromagnetic forces caused by the bombarding of the surface by electrons and positrons, and by the electromagnetic field (see Fig. 6.G.3). It is of notice that the effect, namely the attraction between two metallic, uncharged, plates, drawn in Fig. 6.G.3 as plane surface but which could, in fact, be curved (e) is not so different from that experienced by leptodermic plates which display a surface tension. Setting two of such systems in contact, the "leptodermic" part of their surface. But this is tantamount to saying that the amount of work to separate the systems from each other,

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 references

⁶⁹Casimir (1948).

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7 14 fm(7)

$$\frac{v_F}{c} \approx 0.3$$

$$\Delta = 1.4$$

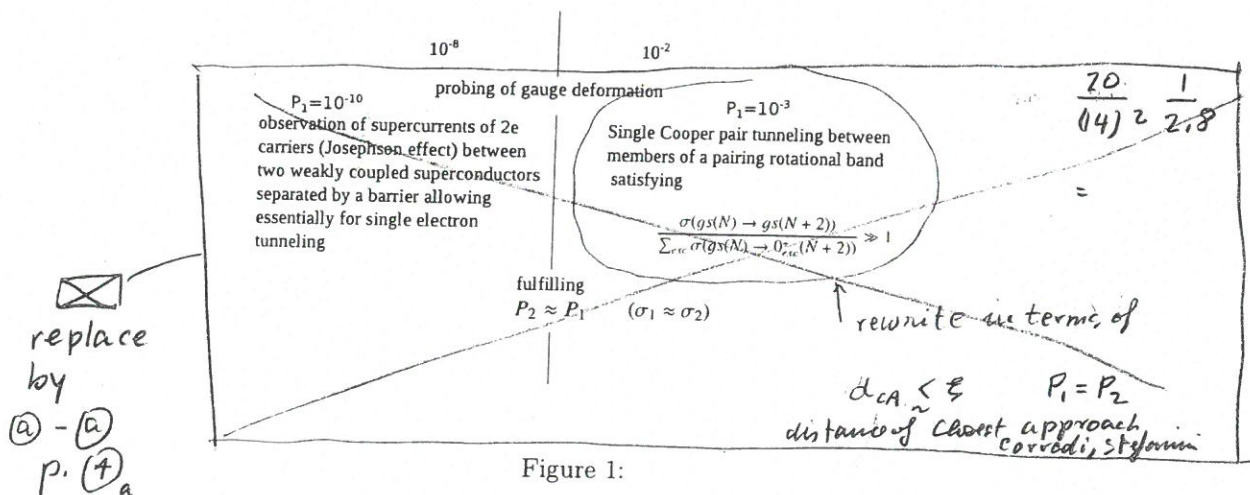


Figure 1:

(a) to Fig. 1 p. 4

mode
locking
scenario

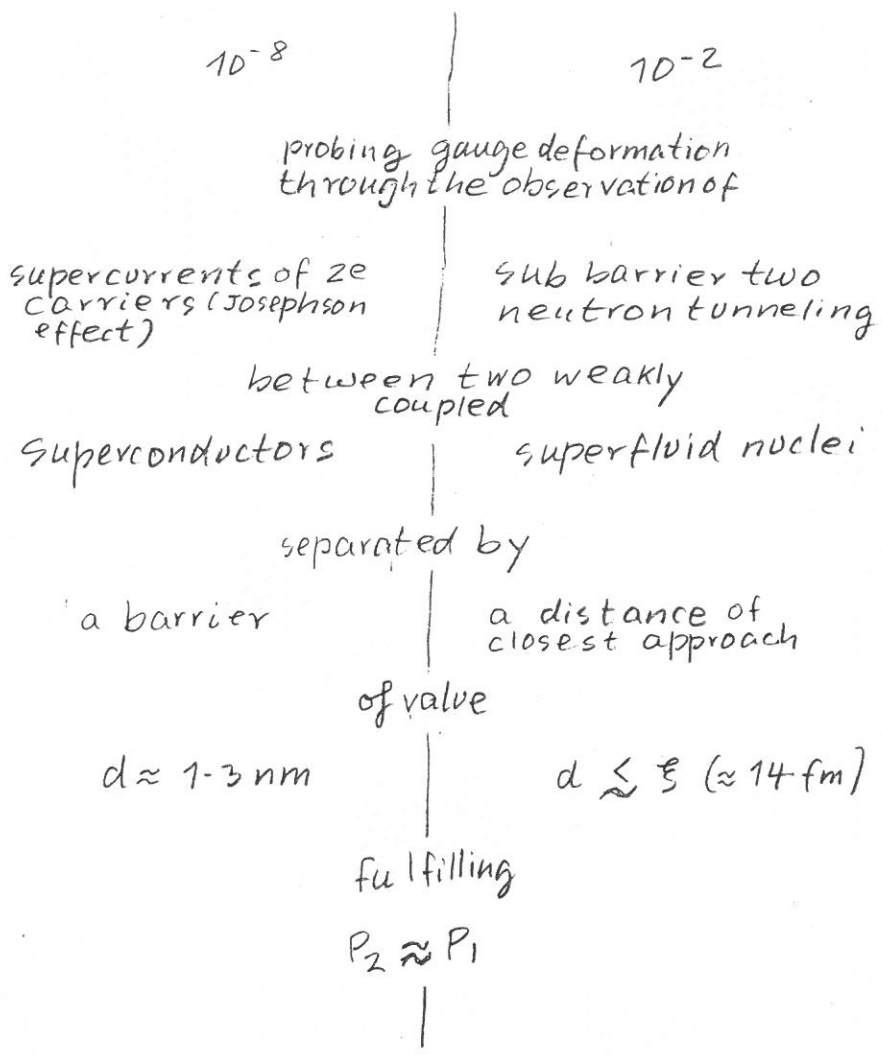


Fig. 1

(a)