EN_5: Theoretical Framework of the Electron and Cooper Pairs

Résumé

Il décrit l'électron non pas comme une particule ponctuelle, mais comme une surface étendue qui définit sa propre orbitale. Sa fermeture géométrique minimale est $n = 137$, associée à la première orbitale atomique et à la constante de structure fine ($\alpha = 1/137$). Si le confinement est rompu, l'onde est libérée sous forme d'énergie. Les paires de Cooper s'expliquent par la liaison géométrique exacte de deux électrons-surface à un trou de réseau, avec un contour $L_{\text{Cooper}} = k \cdot n_{\text{orbital}} \cdot \lambda_e$. La stabilité maximale est obtenue pour $k = 2$ (minimum pour une paire) et des orbitales premières (contours irréductibles). Les orbitales supérieures produisent des paires plus énergétiques et moins stables.

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1. Electron as a surface

The electron is not a point particle.
It is an **extended surface** that defines its own orbital.
Within the atom, the electron **is the orbital**: its position is not defined; the particle and the envelope coincide.

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2. Minimum contour closure

The electron has a **minimum geometric closure**:

$$n = 137$$

- Associated with the **first atomic orbital**
- Defines the **geometric core of stability** of the electron
- Mass = confined wave in this contour
- If confinement is broken, the wave is released → free energy

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3. Cooper Pairs

A **Cooper pair** is the **exact geometric binding** of two electron-surfaces:

- Bound to a **hole in the conductive lattice**
- Preserve the contour $k\,n\,\lambda_e$ as long as the structure exists
- $k = 2 \rightarrow$ minimum contour for two electrons → most stable pair
- Irreducible contour → maximum stability
- If the geometry is broken → the pair is extinguished and the waves are released as radiation

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4. Hierarchy of pairs

When an electron comes from a **higher orbital** ($n > 137$):

- Pair contour:

$$L_{\text{Cooper}} = 2 \cdot n_{\text{orbital}} \cdot \lambda_e$$

- Longer pairs $\rightarrow$ more energetic $\rightarrow$ less stable
- **Energy and stability depend only on the geometry of the contour**
- A **natural hierarchy of pairs** is formed according to the orbital of origin

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5. Geometric irreducibility and primacy of primes

- Stability requires that the contour be **irreducible**
- Prime values of k $\rightarrow$ non-factorizable contours $\rightarrow$ maximum stability
- Composite values $\rightarrow$ internal subcontours $\rightarrow$ lower stability
- $k \geq 2$ $\rightarrow$ necessary condition
- $k = 2$ $\rightarrow$ minimum for a stable Cooper pair

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6. Conclusion

- The electron is completely described as a **confined surface**
- Stability of Cooper pairs depends **exclusively on geometry**
- The most stable pairs come from the **first orbital** ($n = 137$, $k = 2$)
- Higher orbitals produce more energetic, less stable pairs
- The whole theory is **deterministic and geometric**, without probabilities or quantum mechanics

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