**Table S1. Electrical and thermal properties of human skin used for the numerical simulations.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Geometry**  Depth (mm) | **Electrical conductivity** | **Thermal conductivity** | **Heat capacitance** | **Density** |
| **Epidermis** | 0.25  (Pavšelj et al., 2007) | 0.21  (Pavšelj et al., 2007) | 0.234 (Iljaž et al., 2019) | 3589(Iljaž et al., 2019) | 1200(Iljaž et al., 2019) |
| **Dermis** | 1  (Pavšelj et al., 2007) | 0.21  (Pavšelj et al., 2007) | 0.445(Iljaž et al., 2019) | 3300(Iljaž et al., 2019) | 1200(Iljaž et al., 2019) |
| **BCC** | 2  (average  measured value) | 0.334  (Luo et al., 2022) | 0.59 (Verma et al., 2017) | 3150 (Sun et al., 2012) | 1116 (Sun et al., 2012) |
| **SCC** | 2  (average  measured value) | 0.334  (Luo et al., 2022) | 0.558 (Iljaž et al., 2019) | 3852 (Iljaž et al., 2019) | 1030 (Iljaž et al., 2019) |
| **Fat** | 2  (Rahman et al., 2020) | 0.04  (Ramon et al., 2014) | 0.185(Iljaž et al., 2019) | 2674(Iljaž et al., 2019) | 1000(Iljaž et al., 2019) |
| **Electrode** | 0.3mm  3mm ground | (Golberg et al., 2014) | 16  (Golberg et al., 2014) | 466  (Golberg et al., 2014) | 8000  (Golberg et al., 2014) |

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