# S1 Text. Construction of the 2-D computational domain

The computational domain represents a section of a mesophyll cell that contains a single chloroplast surrounded by cytosol. It consists of an rectangle with boundaries (length ), (length ), (length ), and (length ). Boundary represents the tonoplast. Boundary represents the combined cell wall and plasma membrane (Fig A).

was subdivided into three rectangular subdomains , , and . The dimensions of , , and are , and respectively, where represents the thickness of the cytosol and represents the thickness of the stroma. Subdomain represents the outer cytosol. Subdomain represents the inner cytosol. Subdomain lies between and (Fig B).

was further subdivided into a rectangular stroma compartment and two half rectangular cytosol gaps and . The two half cytosol gaps and are adjacent to and , respectively. The remaining part of consists of the stroma compartment . The boundaries of the stroma compartments form the chloroplast envelope. Fig C shows the final geometry of the computational domain.

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| **Fig A:** Schematic drawing of the computational domain and its outer edges , , , and , before compartmentation. represents the tonoplast and represents the cell wall and the plasma membrane. and represent the upper and the lower edges of the computational domain. |

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| **Fig B:** Schematic drawing of the computational domain, after compartmentation of into inner cytosol compartment and outer cytosol compartment , and a subdomain between and |

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| **Fig C:** Schematic drawing of the computational domain, after compartmentation of into a stromal compartment and two cytosol gaps and . |