

# Model AR\_005

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## 1. Patient Details

Body Mass Index: 31

Age: 67

Approximate Skin Thickness: 3 mm

## 2. Axillary Regions Models

### 2.1 Right:

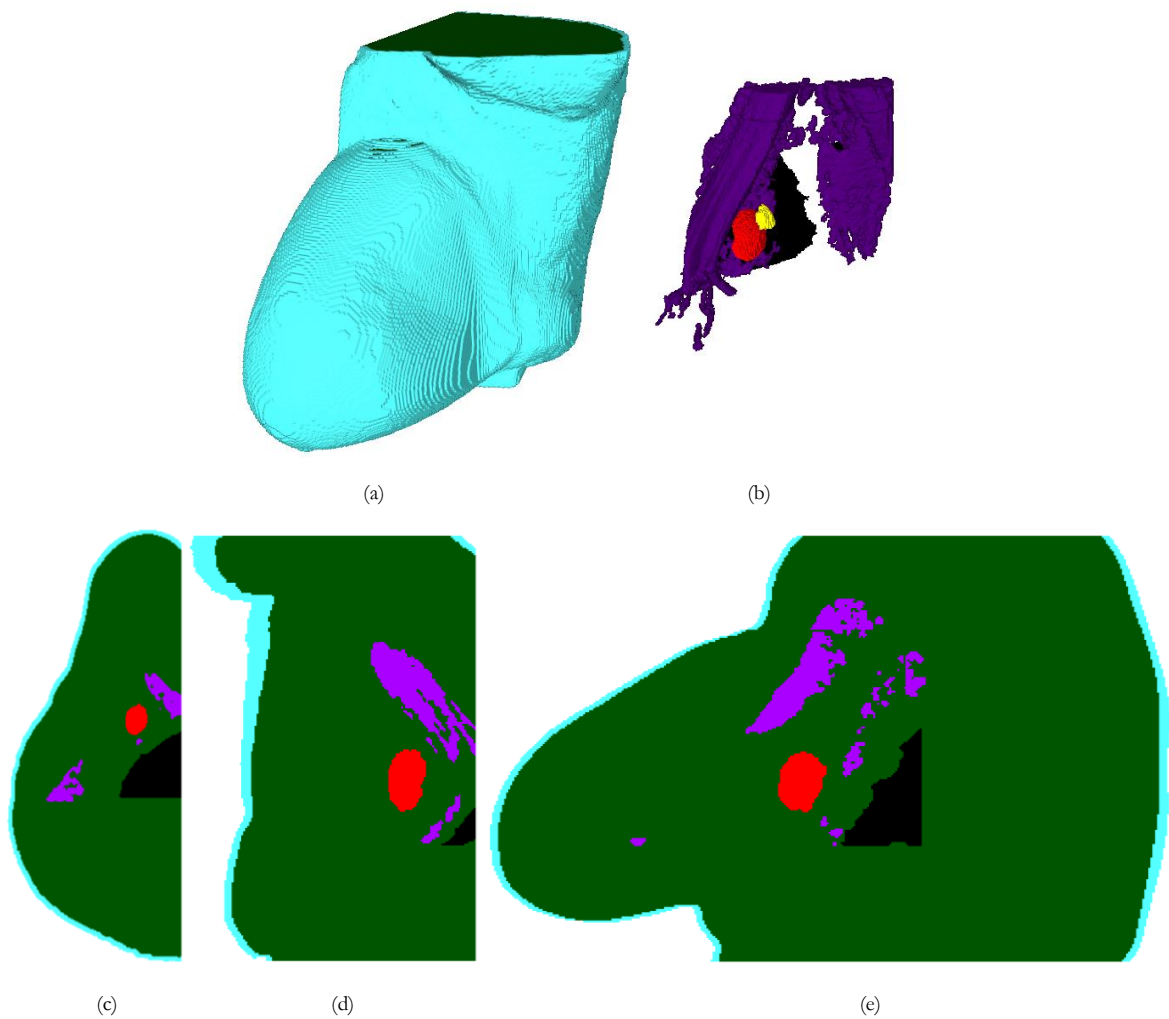


Figure 1. Right axillary region model in (a) 3D with all tissues, (b) 3D without skin and adipose tissue, (c) axial, (d) coronal, and (e) sagittal views. Blue represents the skin, green represents the adipose tissue, purple represents the muscle and remaining fibroglandular tissue, black represents the lung cavity, yellow represents the healthy Axillary Lymph Nodes (ALNs) and red represents the metastasised ALNs.

#### Available Files:

1. AR\_005\_R\_skin (.mat/.raw/.stl)
2. AR\_005\_R\_skin\_filled (.stl)
3. AR\_005\_R\_adipose (.mat/.raw/.stl)
4. AR\_005\_R\_adipose\_filled (.stl)
5. AR\_005\_R\_lung (.mat/.raw/.stl)
6. AR\_005\_R\_muscle (.mat/.raw/.stl)
7. AR\_005\_R\_h\_aln (.mat/.raw/.stl)
8. AR\_005\_R\_m\_aln (.mat/.raw/.stl)
  
9. AR\_005\_R\_label\_map (.mat/.raw)
10. AR\_005\_R\_weight\_map (.mat/.raw)

Grid Size: 217 x 443 x 169 (Axial x Coronal x Sagittal)

Voxel Size: 0.9965 x 0.9965 x 1 (Axial x Coronal x Sagittal)

Number of Healthy Lymph Nodes: 1

Number of Metastasised Lymph Nodes: 1

#### Volume Ratios:

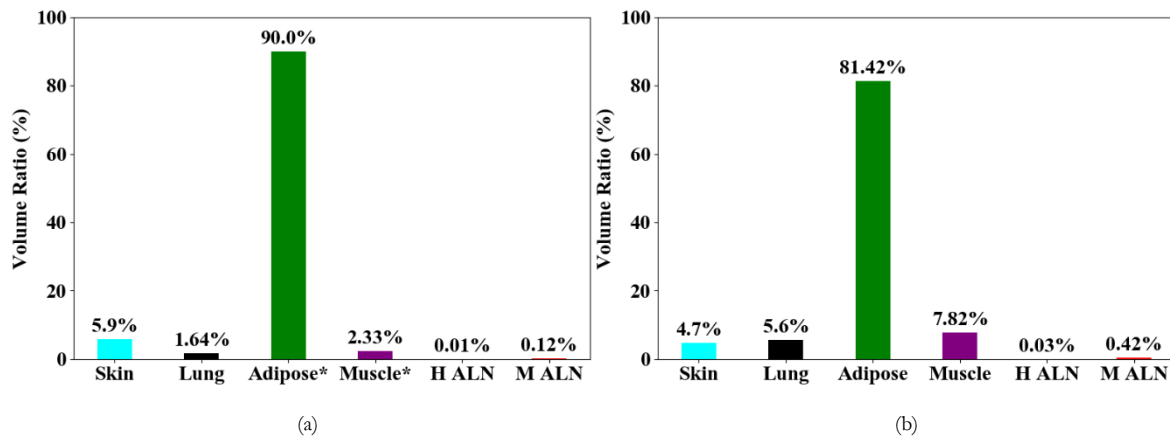


Figure 2. Ratio between the volume of each tissue type and the total volume (a) of the whole model and (b) restricted to the axillary region. The asterisk \* means that other tissue types could have been included in the calculation, such as fibroglandular tissue. H means Healthy and M means Metastasised.

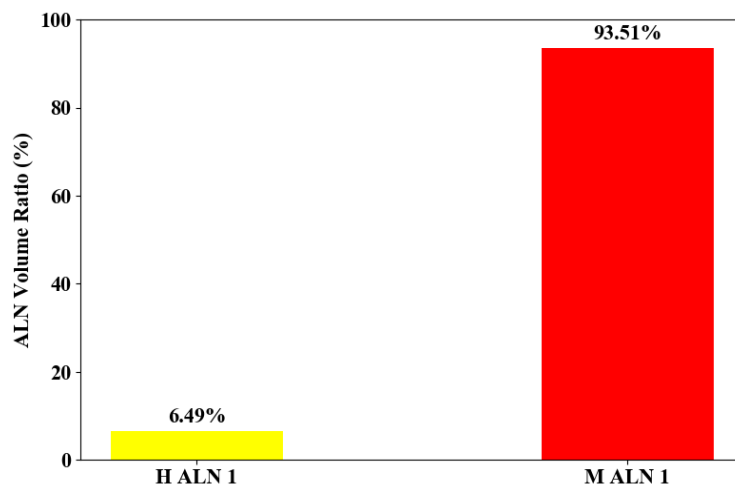


Figure 3. Ratio between the volume of each Axillary Lymph Node (ALN) and the total volume of ALNs. H means Healthy and M means Metastasised.

D. M. Godinho, 2021

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Dielectric properties considering MRI-intensity-based dielectric properties map:

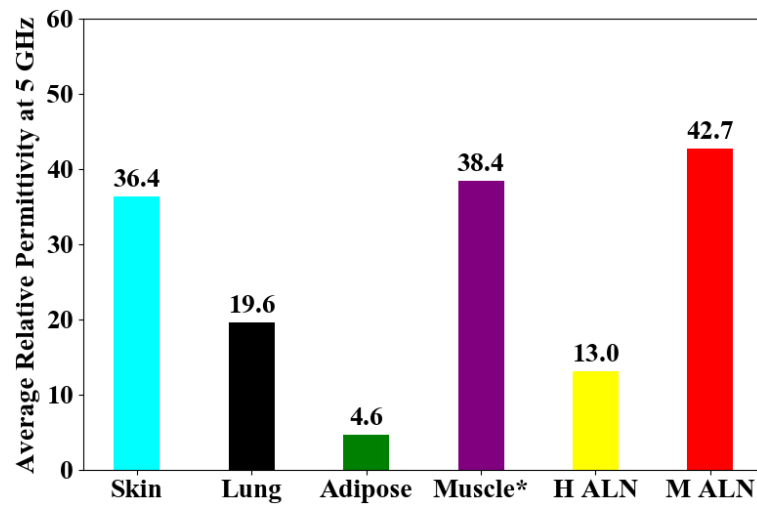


Figure 4. Average relative permittivity of each tissue type at 5 GHz. The asterisk \* means that other tissue types could have been included in the calculation, such as fibroglandular tissue. H means Healthy and M means Metastasised.

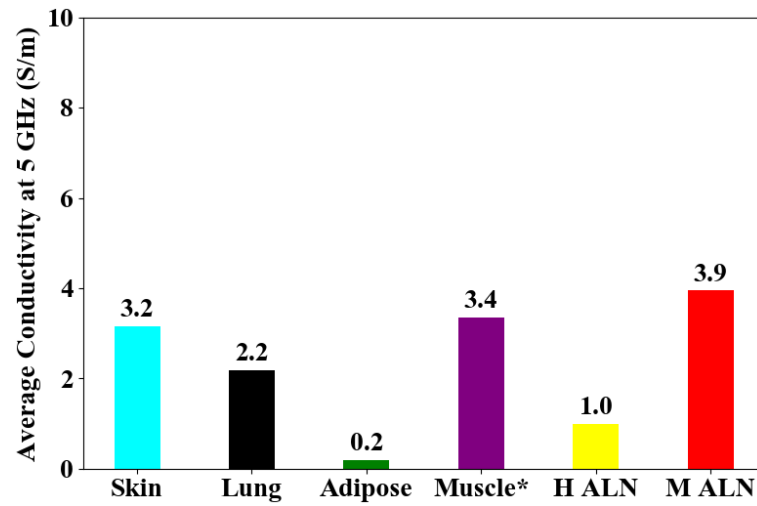


Figure 5. Average conductivity of each tissue type at 5 GHz. The asterisk \* means that other tissue types could have been included in the calculation, such as fibroglandular tissue. H means Healthy and M means Metastasised.

## 2.2 Left:

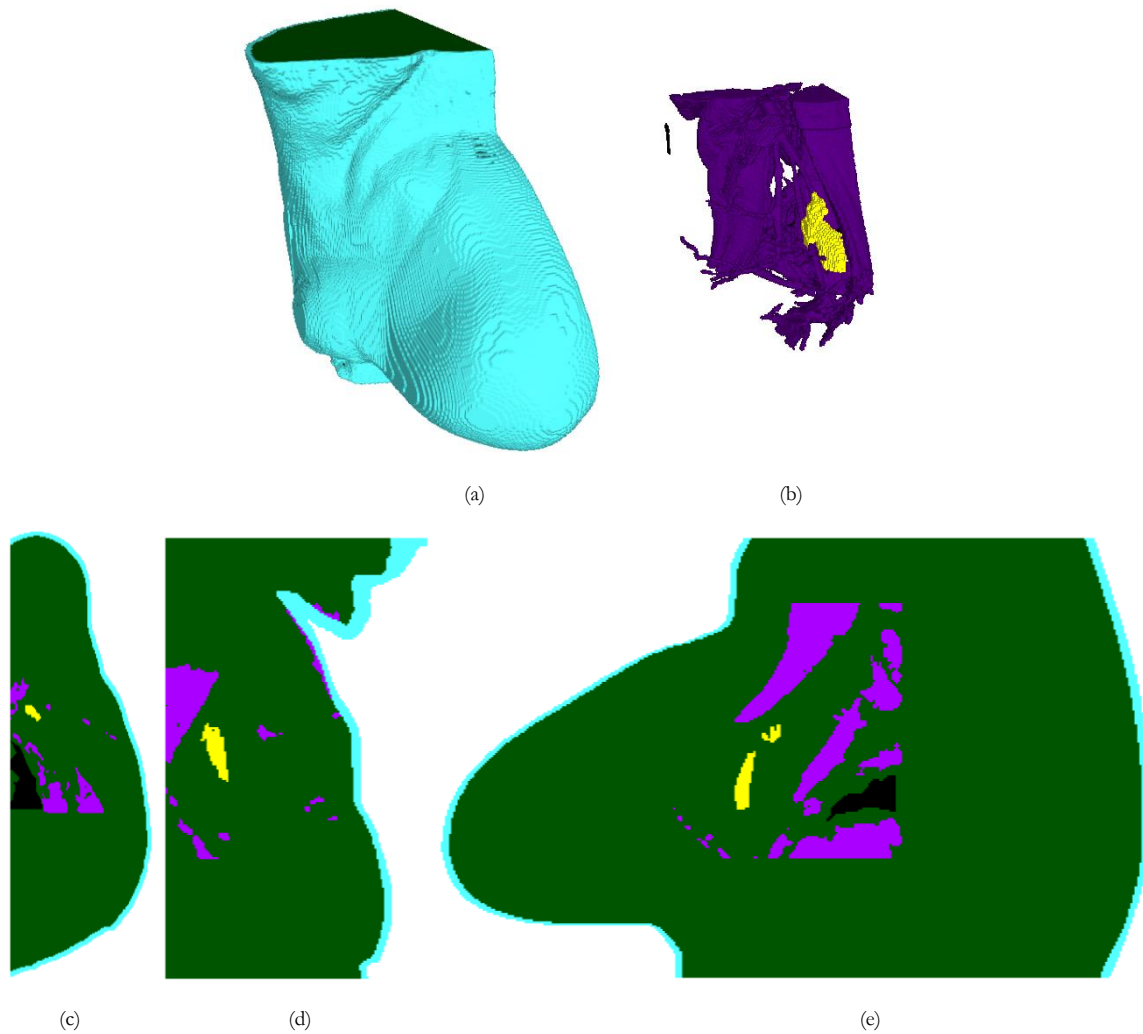


Figure 6. Left axillary region model in (a) 3D with all tissues, (b) 3D without skin and adipose tissue, (c) axial, (d) coronal, and (e) sagittal views. Blue represents the skin, green represents the adipose tissue, purple represents the muscle and remaining fibroglandular tissue, black represents the lung cavity, and yellow represents the healthy Axillary Lymph Nodes (ALNs).

### Available Files:

1. AR\_005\_L\_skin (.mat/.raw/.stl)
2. AR\_005\_L\_skin\_filled (.stl)
3. AR\_005\_L\_adipose (.mat/.raw/.stl)
4. AR\_005\_L\_adipose\_filled (.stl)
5. AR\_005\_L\_lung (.mat/.raw/.stl)
6. AR\_005\_L\_muscle (.mat/.raw/.stl)
7. AR\_005\_L\_h\_aln (.mat/.raw/.stl)
8. AR\_005\_L\_label\_map (.mat/.raw)
9. AR\_005\_L\_weight\_map (.mat/.raw)

Grid Size: 217 x 443 x 138 (Axial x Coronal x Sagittal)

Voxel Size: 0.9965 x 0.9965 x 1 (Axial x Coronal x Sagittal)

Number of Healthy Lymph Nodes: 2

Number of Metastasised Lymph Nodes: 0

D. M. Godinho, 2021

To cite this work, please cite as: D. M. Godinho, J. M. Felício, T. Castela, N. A. Silva, M. L. Orvalho, C. A. Fernandes, R. C. Conceição, "MRI-based Axillary Numerical Models and Extraction of Axillary Lymph Nodes Dielectric Properties for Microwave Imaging" (under review in Medical Physics, 2021).

### Volume Ratios:

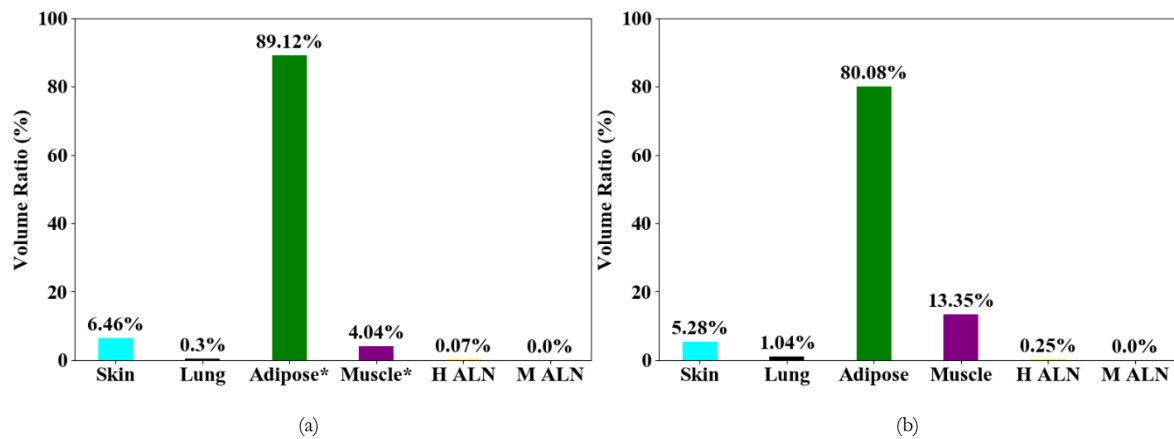


Figure 7. Ratio between the volume of each tissue type and the total volume (a) of the whole model and (b) restricted to the axillary region. The asterisk \* means that other tissue types could have been included in the calculation, such as fibroglandular tissue. H means Healthy and M means Metastasised.

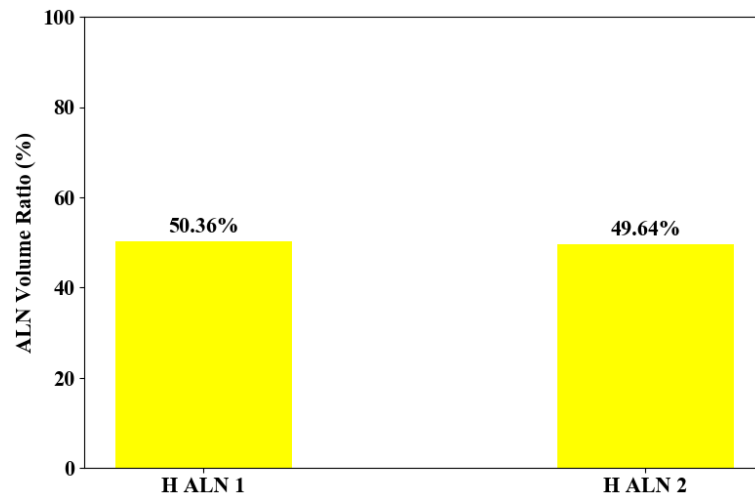


Figure 8. Ratio between the volume of each Axillary Lymph Node (ALN) and the total volume of ALNs. H means Healthy.

### Dielectric properties considering MRI-intensity-based dielectric properties map:

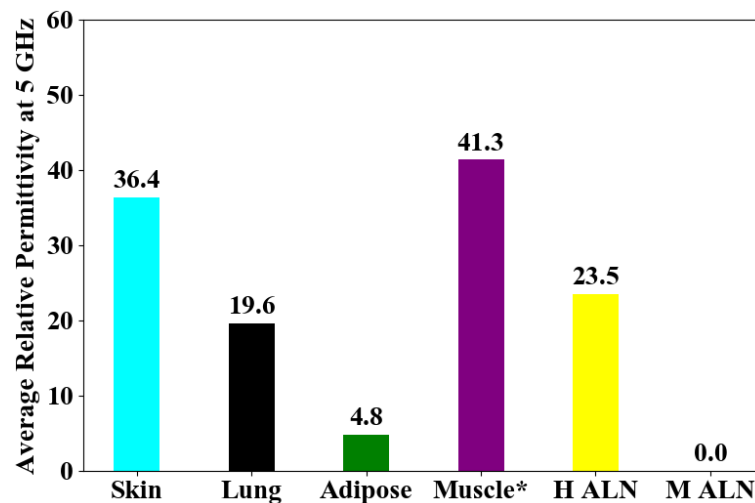


Figure 9. Average relative permittivity of each tissue type at 5 GHz. The asterisk \* means that other tissue types could have been included in the calculation, such as fibroglandular tissue. H means Healthy and M means Metastasised.

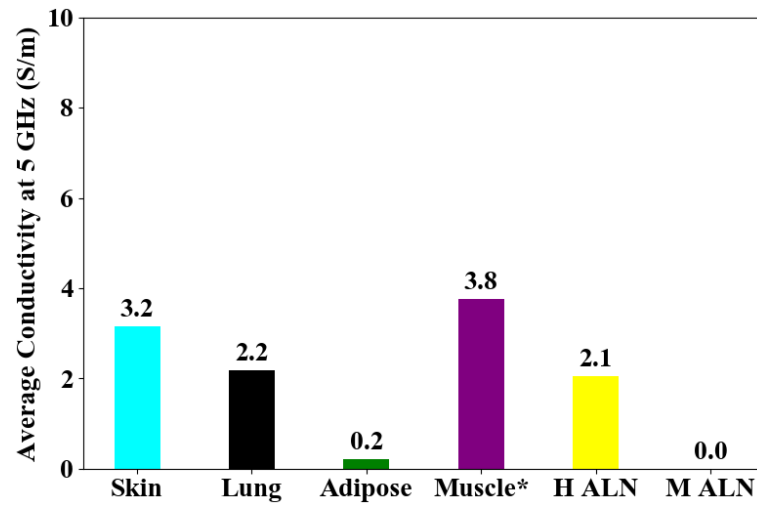


Figure 10. Average conductivity of each tissue type at 5 GHz. The asterisk \* means that other tissue types could have been included in the calculation, such as fibroglandular tissue. H means Healthy and M means Metastasised.

### 3. Dielectric Properties:

Read “Assigning\_Dielectric\_Properties\_to\_MRI-based\_Models” file located in the root folder.