Radiation Unit Model 6/29/2011 10:30 AM

# The Couch Coordinates

X

Y

Z

1. X+, Y+, Z+ form a right-handed coordinate system
2. Origin: The breast hole center at the treatment couch bottom. (Defined as the **COUCH REFERENCE POINT**)
3. X: lengthwise direction of the treatment couch; X+ is patient head direction
4. Y: widthwise direction of the treatment couch
5. Z: treatment couch up-down direction; Z+: up direction

# Focus Travel Region

R

H

S

H: FocusUpperRegionHeight R: FocusUpperRegionRadius S: FocusInnerCupSeparation

The red shape in the figure is an inner cup

# Radiation Unit Param Table [.rduparam]

Encoding: US-ASCII



# Phantom Param Table [.ptmparam]

Encoding: US-ASCII



Remark:

Todo: Description of the focus travel region in the phantom.

# Code

1. **Main file:** RduGen.m
2. **Usage**: [RduParam, PtmParam] = RduGen(RadiationUnitType, KddScalar);
3. **Example**: [RduParam, PtmParam] = RduGen(999, 0.0)
4. **Dependency**:
   1. CwLoadRduParam.m
   2. CwLoadPhantomParam.m
   3. CwSaveAsDotRdu.m
5. **Input** from directory RadiationUnit\In\
   1. R%d.rduparam (refer to Section 3)
   2. R%d.ptmparam (refer to Section 4)
6. **Output** to directory RadiationUnit\Out\
   1. R%d.rdu (Encoding: US-ASCII)

|  |  |
| --- | --- |
| 1 | R.U. Type, 1-99999999 |
| **2** | # of OuterCups |
| **1 4 A B C D** | OuterCupType1, # of InnerCups, InnerCupType Vector |
| **2 4 E F G H** | OuterCupType2, # of InnerCups, InnerCupType Vector |
| **1 20** | # of collimators followed by integral collimator sizes (mm) |
| **KddScalar** | multiplier to be applied to the precalculated kernel dose distributions, such that the reference dose rate is 1Gy/min |
| **FocusUpperRegionRadius** | Parameter in mm defined in Focus Travel Region |
| **FocusUpperRegionHeight** | Parameter in mm defined in Focus Travel Region |
| **FocusInnerCupSeparation** | Parameter in mm defined in Focus Travel Region |
| **MinVel(X Y Z)**  **MaxVel(X Y Z)** | The minimum and maximum focus velocity in mm/second in X, Y, Z-directions in Couch Coord |
| **MinAccl(X Y Z)**  **MaxAccl(X Y Z)** | The minimum and maximum focus acceleration in mm/second in X, Y, Z-directions in Couch Coord |
| **MinCollimatorSwitchTime** | The minimum time in seconds to switch the collimator from one state (size) to another |
| **PhantomInnerCupType** | Equivalent InnerCupType string (US-ASCII) |
| **PhantomHoleCenter(X Y Z)** | Phantom Hole Center X,Y,Z-Position in mm |
| **PhantomHoleSize(X Y Z)** | Phantom Hole X,Y,Z-Size in mm |

1. **Remark:** Called twice: before MC (w/ KddScalar = 0) and After MC (w/ correct KddScalar)