



## IBA proton therapy solutions

**Yves Jongen, Founder and Chief Research Officer**  
**AAPM Particle Beam Therapy Symposium, August 3 2013**



# IBA CLINICALLY PROVEN PROTON THERAPY TECHNOLOGY



## IBA EXPERIENCE IN PROTON THERAPY

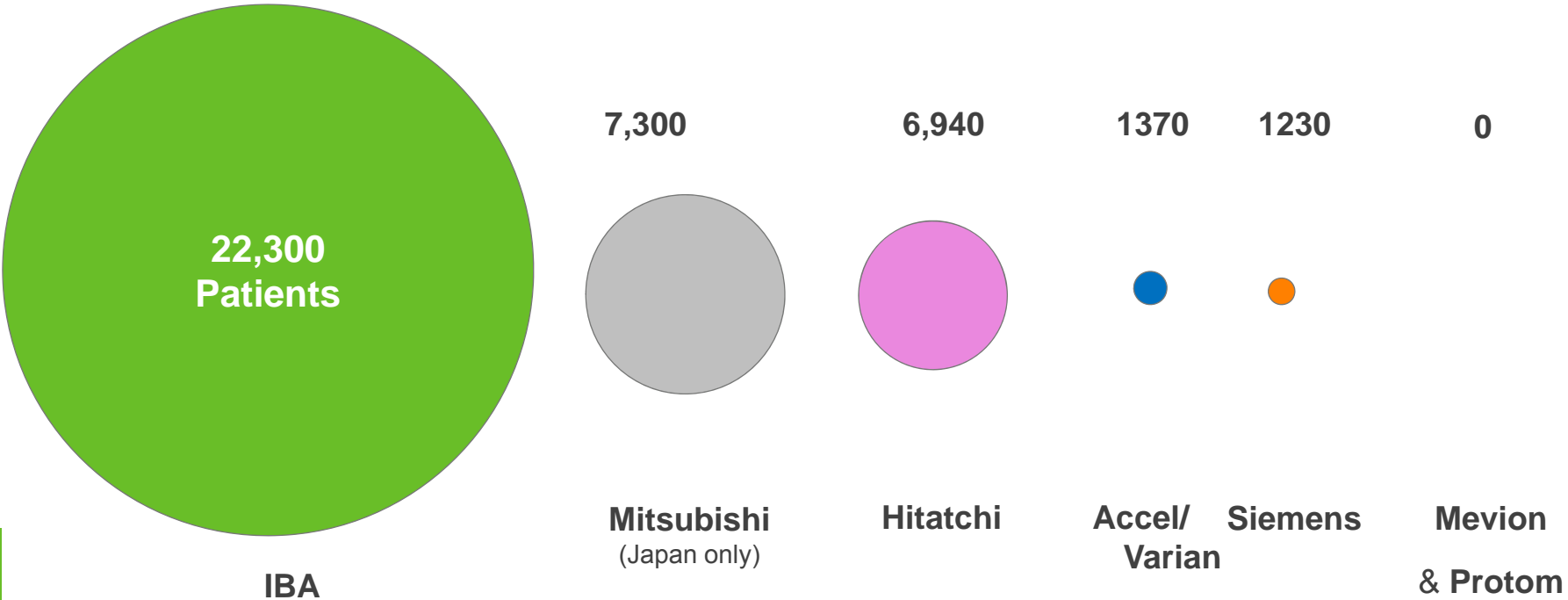
20+  
YEARS OF  
EXPERIENCE

20+  
CENTERS SOLD

20,000+  
PATIENTS TREATED



# IBA PROTON THERAPY PATIENT BASE

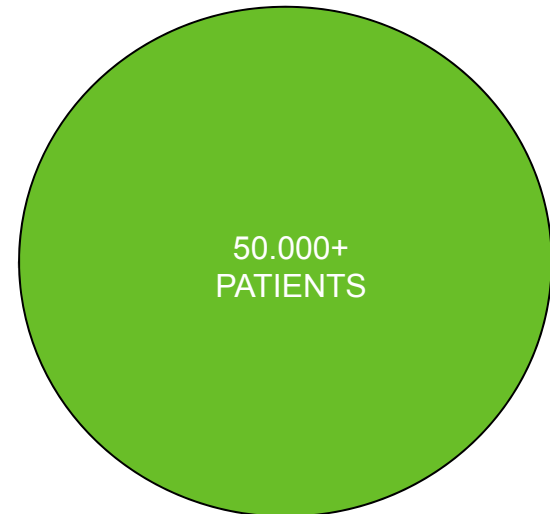


Source: PTCOG End 2012

# UNRIVALLED EXPERIENCE LARGEST PATIENT BASE

20 000+ PATIENTS TREATED (END 2012)

**IBA EQUIPMENT**



**#2 PT EQUIPMENT PROVIDER**



# 25 YEARS OF EXPERIENCE AND INNOVATION

## 26 REFERENCE CENTERS

15 CENTERS  
TREATING  
PATIENTS

**3** (2008) MASSACHUSETTS  
GENERAL HOSPITAL  
BURR PROTON THERAPY  
CENTER  
Boston, MA, USA  
*Treating since 2001*

**4** (2004) UNIVERSITY OF FLORIDA  
PROTON THERAPY  
INSTITUTE  
Jacksonville, FL, USA  
*Treating since 2006*

**2** (2006) WANJIE PROTON  
THERAPY CENTER  
Zibo, China  
*Treating since 2004*

**3** (2008) NATIONAL CANCER  
CENTER  
Kashiwa, Japan  
*Treating since 1998*

**5** (2006) HAMPTON UNIVERSITY  
PROTON THERAPY  
INSTITUTE  
Hampton, VA, USA  
*Treating since 2010*

**4** (2006) PROCURE PROTON  
THERAPY CENTER  
Princeton, NJ, USA  
*Treating since 2012*

**3** (2006) NATIONAL CANCER  
CENTER  
Ilsan, Korea  
*Treating since 2007*

**4** (2008) CDH PROTON THERAPY  
CENTER, A PROCURE  
CENTER  
Chicago, IL, USA  
*Treating since 2011*

**2** (2006) CENTRE DE PROTONTHÉRAPIE  
DE L'INSTITUT CURIE  
Paris (Orsay), France  
*Treating since 2009*

**5** (2006) UNIVERSITY OF  
PENNSYLVANIA HEALTH  
SYSTEM ROBERTS PROTON  
THERAPY CENTER  
Philadelphia, PA, USA  
*Treating since 2009*

**4** (2006) PROTON THERAPY  
CENTER CZECH S.R.O.  
Prague, Czech Republic  
*Treating since 2012*

**4** (2008) PROCURE PROTON THERAPY  
CENTER IN OKLAHOMA CITY  
Oklahoma City, OK, USA  
*Treating since 2009*

**2** (2007) INDIANA UNIVERSITY HEALTH  
PROTON THERAPY CENTER  
Bloomington, IN, USA  
*Treating since 2004*

**4** (2006) WESTDEUTSCHES  
PROTONENTHERAPIEZENTRUM  
ESSEN (WPE)  
Essen, Germany  
*Treating since 2013*

**4** (2008) PROCURE PROTON  
THERAPY CENTER  
Seattle, WA, USA  
*Treating since 2013*

6 CENTERS  
UNDER  
INSTALLATION/  
COMMISSIONING

**2** (2008) AGENZIA PROVINCIALE  
PER LA PROTONTERAPIA  
(ATREP)  
Trento, Italy  
*Opening in 2013*

**2** (2006) BRONOWICE CYCLOTRON  
CENTER  
Kraków, Poland  
*Opening in 2013*

**1** (2008) UNIVERSITÄTKLINIKUM  
CARL GUSTAV CARUS  
Dresden, Germany  
*Opening in 2014*

**2** (2006) SKANDIONKLINIKEN  
Uppsala, Sweden  
*Opening in 2013*

**3** (2008) THE PROTON THERAPY  
CENTER LLC (TPTC)  
PROVISION HEALTHCARE  
Knoxville, TN, USA  
*Opening in 2014*

**1** (2006) WILLIS-KNIGHTON  
CANCER CENTER  
Shreveport, LA, USA  
*Opening in 2014*

5 CENTERS  
UNDER  
CONSTRUCTION

**4** (2008) FEDERAL HIGH-TECH  
MEDICAL CENTER  
Dimitrovgrad, Russia,  
Europe  
*Opening in 2013*

**1** (2006) CENTRE  
ANTOINE LACASSAGNE  
Nice, France  
*Opening in 2014*

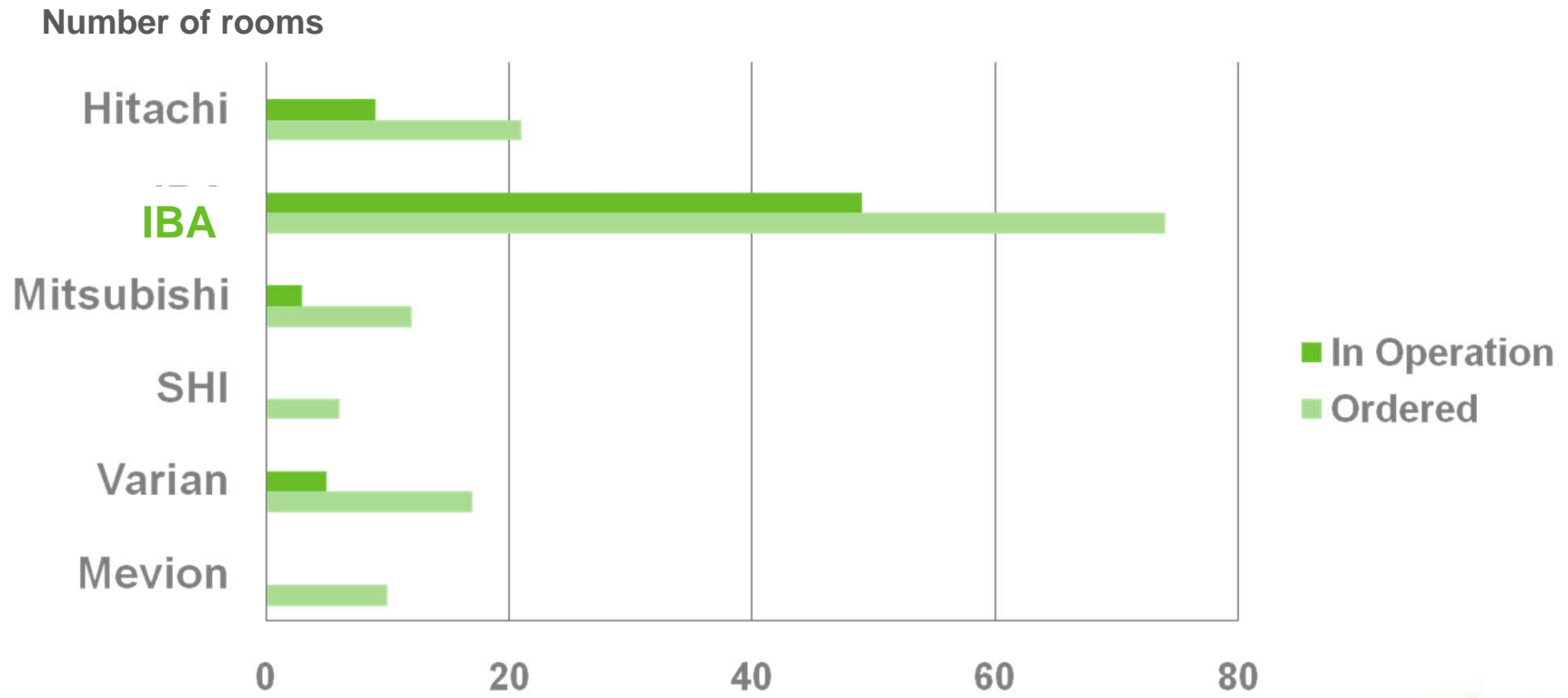
**3** (2008) TEXAS CENTER  
FOR PROTON THERAPY  
Dallas, TX, USA  
*Opening in 2015*

**3** (2008) APOLLO PROTON  
THERAPY CENTER  
Chennai, India  
*Opening in 2016*

**1** (2006) Taiwan Cancer  
Center  
*Opening in 2017*



## INSTALLED BASE LANDSCAPE: IBA 55% SHARE



# THE ONLY PROVEN CLINICAL PT TECHNOLOGY

## A COMPLETE RANGE OF PROTON THERAPY SOLUTIONS

### 4 TYPES OF TREATMENT ROOMS



**360°GRANTRY  
TREATMENT ROOM**



**FIXED BEAM  
TREATMENT ROOM**



**SMALL FIXED BEAM  
TREATMENT ROOM**



**220°COMPACT GANTRY  
TREATMENT ROOM**



# RECORD TIME OF 12 MONTHS TO FIRST PATIENT\*

\*From building occupancy date at Seattle Cancer Care Alliance (SCCA) Proton Therapy Center, a Procure Proton Therapy center, Seattle, WA, USA

## IBA, A COMMUNITY OF RENOWNED PARTNERS AND CUSTOMERS

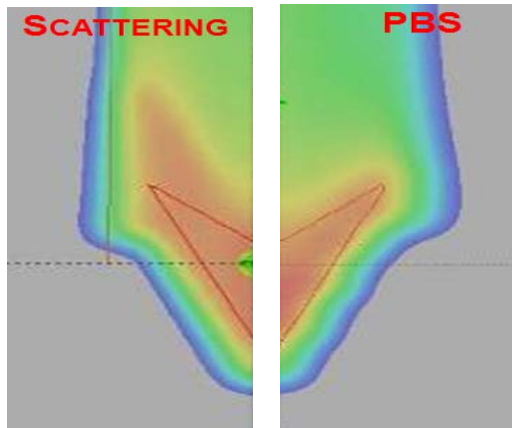
- **COMMUNITY OF CLINICAL USERS** DEFINING THE FUTURE OF PROTON THERAPY
- THE BROADEST **COLLABORATIVE PROTON THERAPY RESEARCH** PROGRAM
- **A YEARLY USERS' MEETING** ORGANIZED TO DEVELOP PROTON THERAPY TECHNOLOGY AND APPLICATIONS



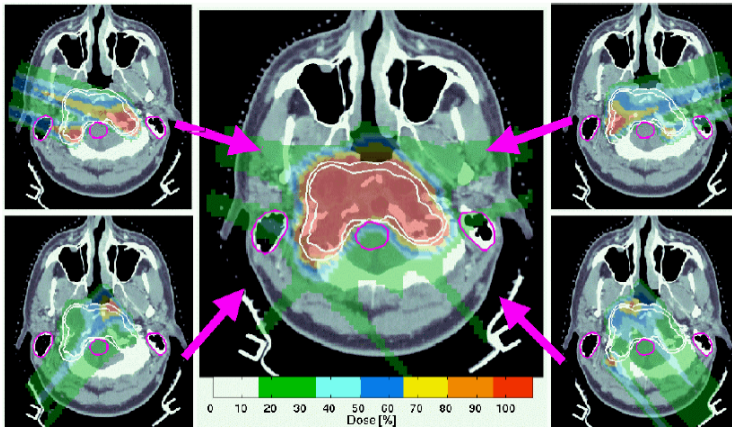
THE PBS TECHNOLOGY OF TOMORROW IS  
NOW DEMONSTRATED (AND ACCEPTED) IN  
TRENTO



# ADVANCED PENCIL BEAM SCANNING



- Better dose conformity
- Single field uniform dose or intensity modulated proton therapy (IMPT)
- Easier operation
- Lower cost
- Easy plan evolution (Adaptive Proton Therapy)
- Lower neutron production



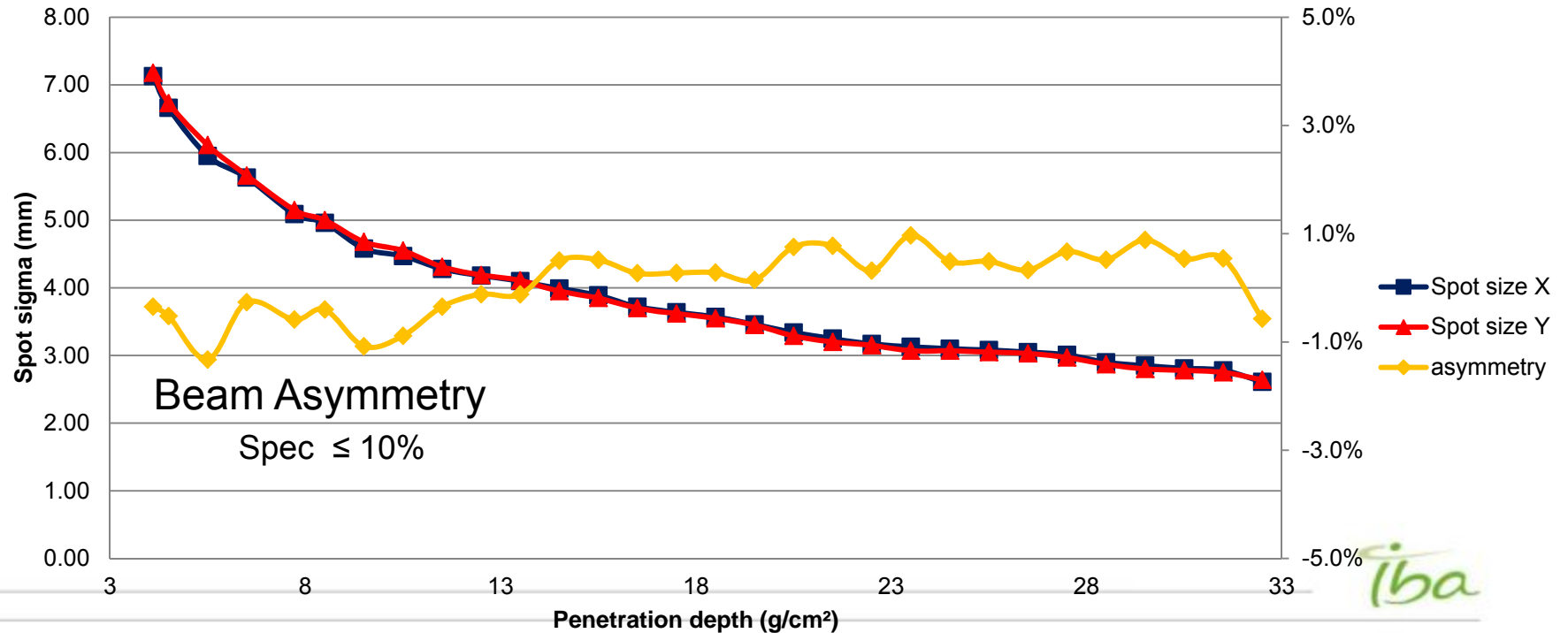
Courtesy of Alex Trofimov (Massachusetts General Hospital)

Tiba



# VERY SYMETRICAL AND GAUSSIAN PENCIL BEAM REDUCES CLINICAL COMMISSIONING TIME

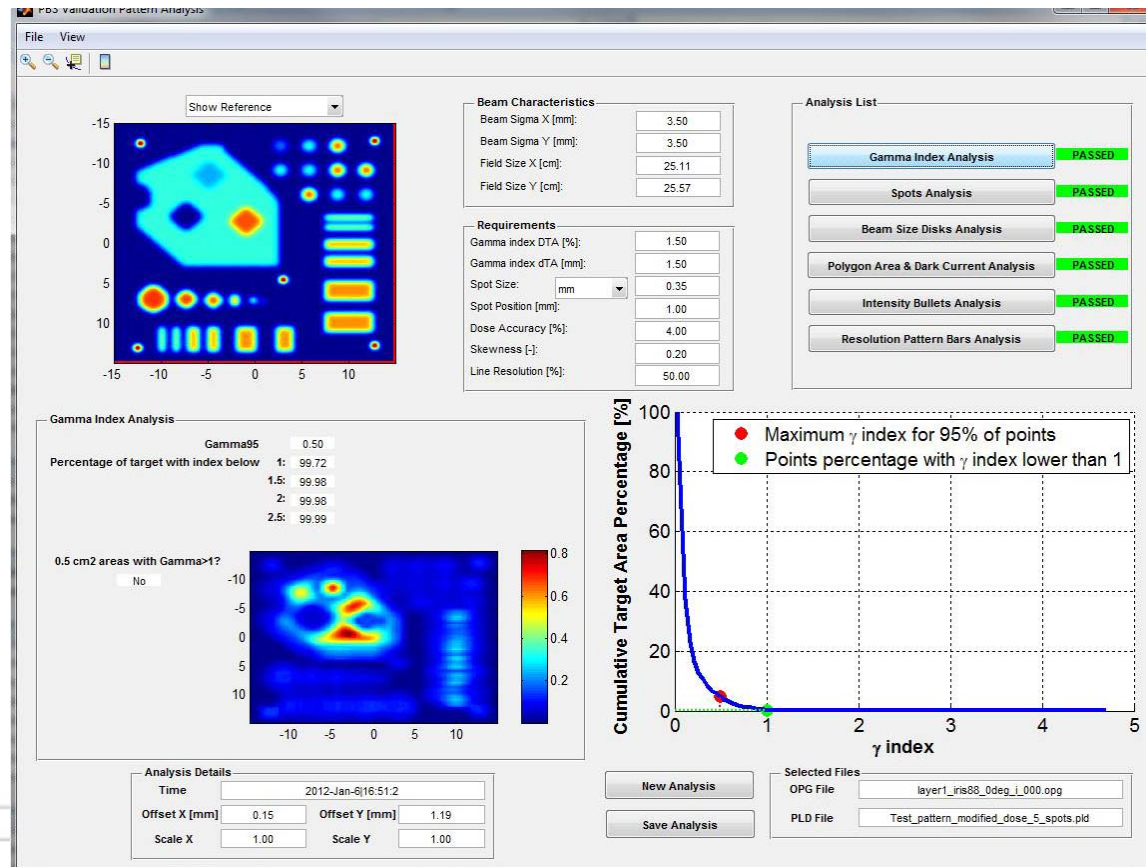
## Spot Size (One sigma) in air at Isocentre Gantry 0° AtreP



# PENCIL BEAM SCANNING ACCEPTANCE TEST PATTERN

226 MeV

95% of the points  
with gamma  
index < 1  
1DTA (1.5% , 1.5mm)



## FASTER DOSE DELIVERY IS THE KEY OF ADVANCED PBS

- Delivery of a 2Gy in 10X10X10cm<sup>3</sup>
  - At high range in **less than 60s**
  - At low range using Ridge Filter in **less than 60s**



# PROTEUS® ONE

- 70% volume reduction
- Footprint of a tennis court

*\* CBCT and 220° Compact Gantry are ongoing developments.  
The marketing approval will be subject to review by competent authorities (FDA, Notified bodies, et al...)*

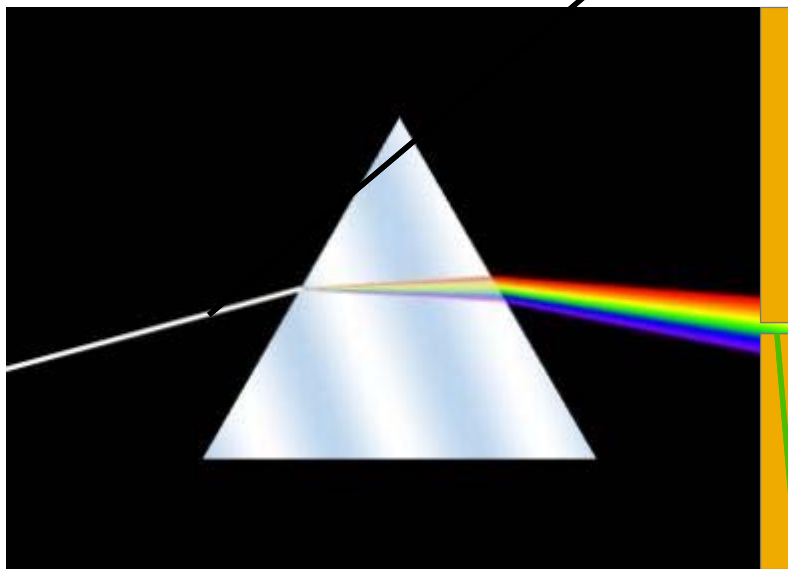
# Proteus<sup>®</sup> ONE

A HIGH PERFORMANCE, NO COMPROMISE, COST EFFECTIVE ONE ROOM SYSTEM

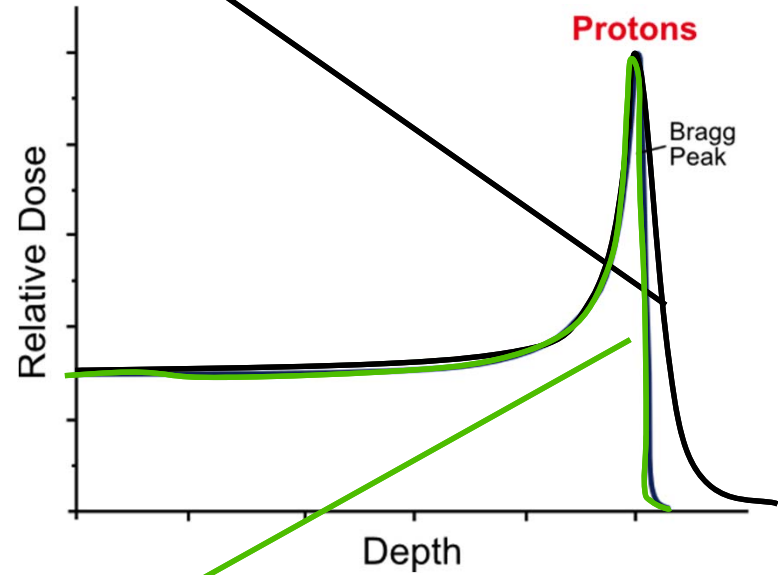


# WHY AN ENERGY SELECTION SYSTEM IS NEEDED

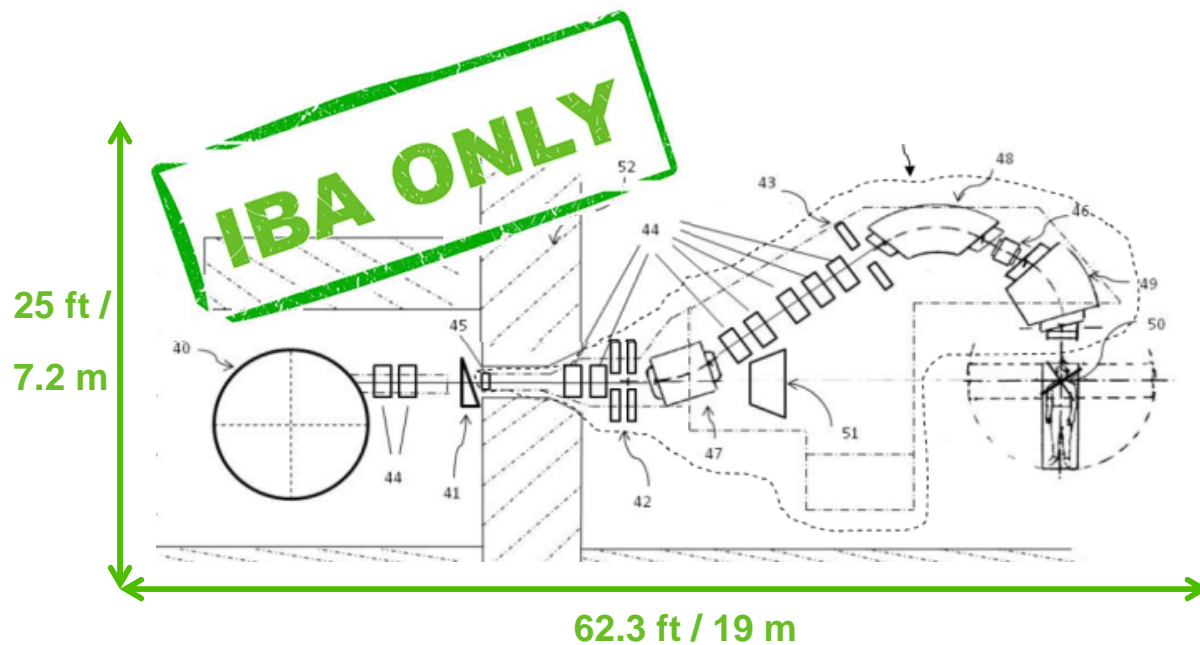
Polychromatic




Monochromatic



# ESS INTEGRATED IN THE GANTRY OPTICS REDUCED GANTRY RADIUS & LONG SAD: SCANNING UPSTREAM

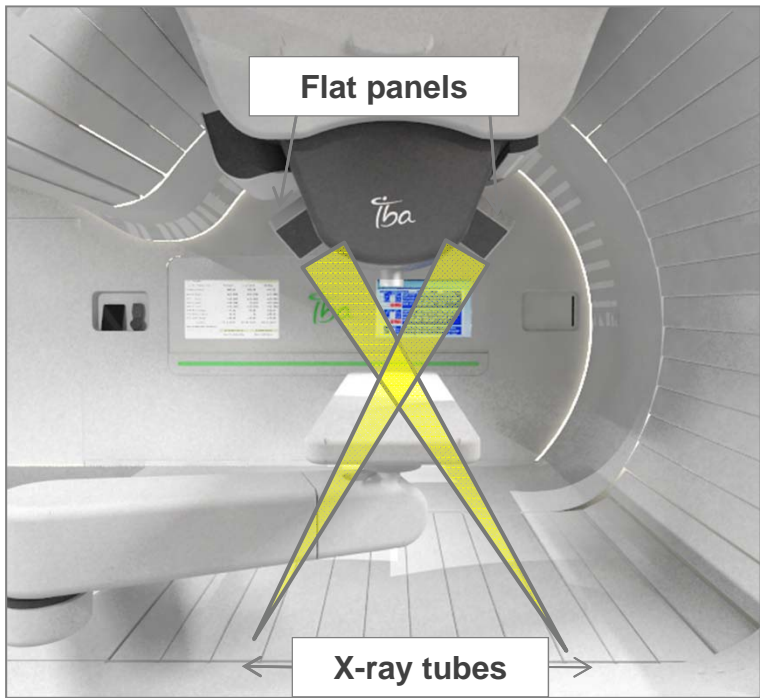


- Size XS
- Neutron 
- PBS
- IGPT
- Patient centric

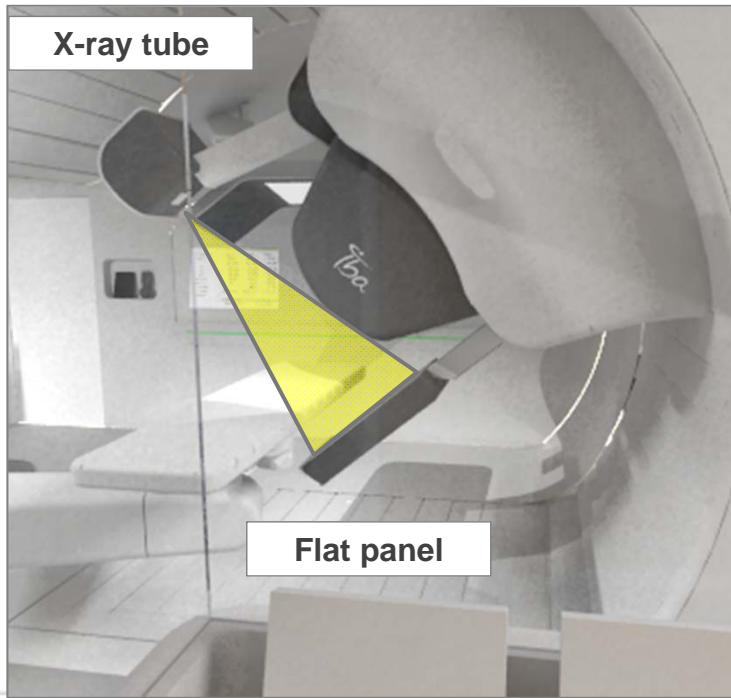
# PATIENT ALIGNMENT & MOTION CONTROL

2 OPTIONS

Stereoscopic X-ray



CBCT

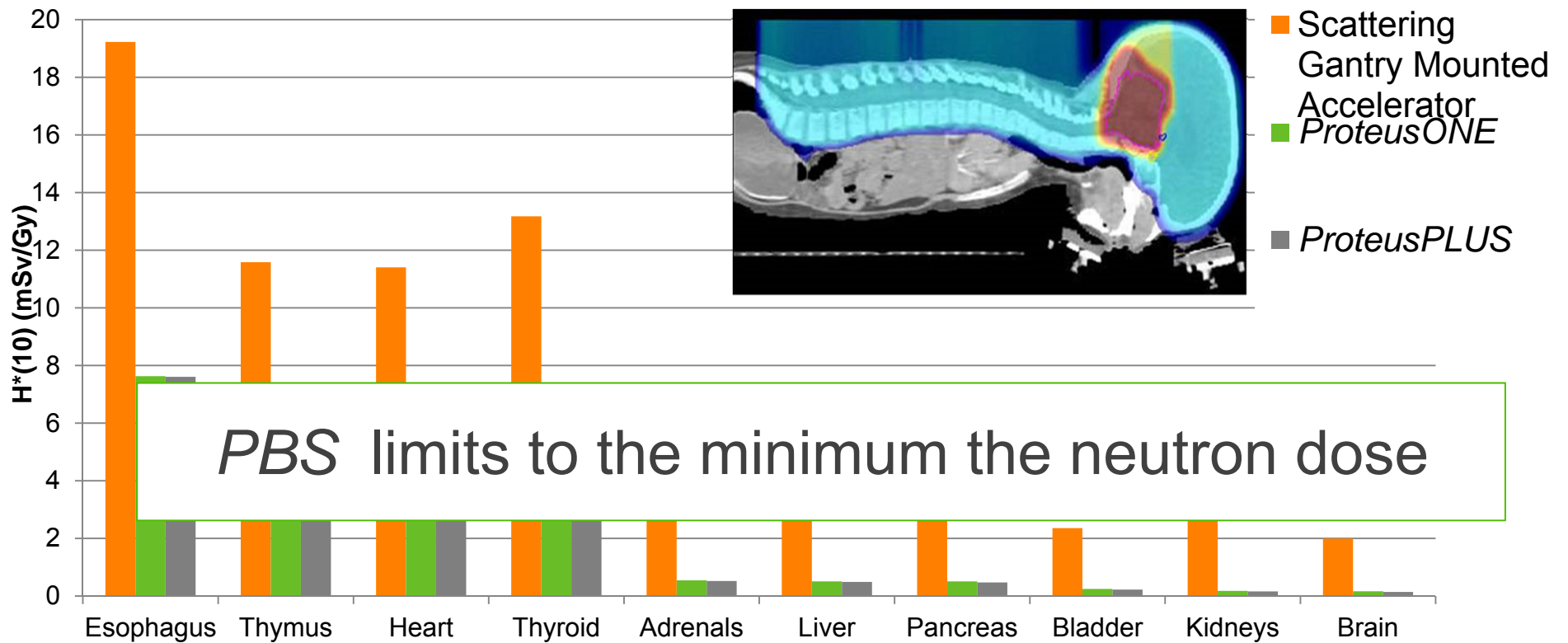


*PHILIPS AMBIENT EXPERIENCE*

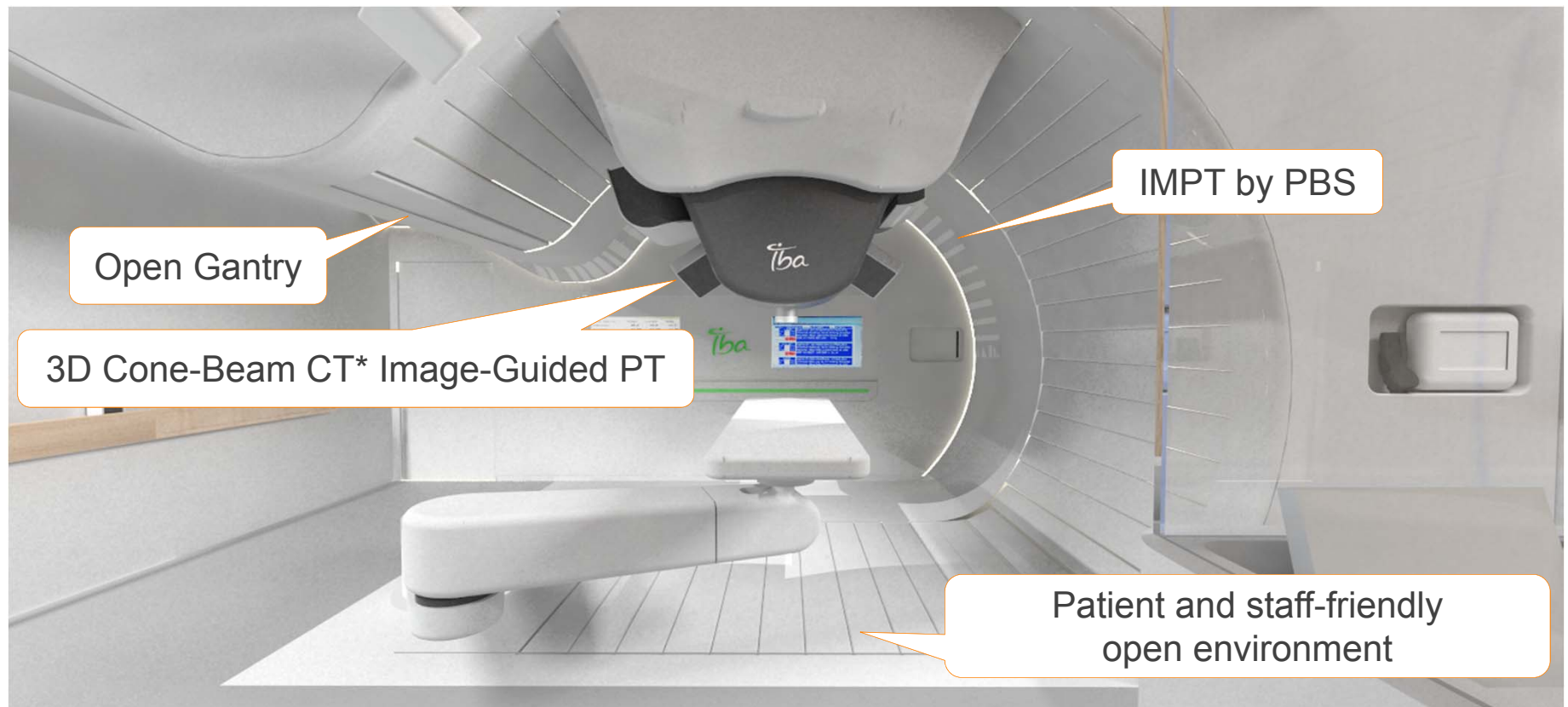




## RATIO OF NEUTRON TO PROTON DOSE (MEDULLOBLASTOMA)



# *PROTEUS***ONE**, FULL FEATURES, FULL PERFORMANCE SINGLE ROOM SYSTEM





# THE PROTOTYPE S2C2 IN FACTORY TESTS



Tiba

## WILLIS KNIGHTON COMPACT GANTRY IN FACTORY IN JUNE



*Tba*



# WILLIS KNIGHTON COMPACT GANTRY IN FACTORY IN JUNE



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QUESTIONS?

