ESNM Webinar Series on basic NM
Basic PET physics and instrumentation
Part 1

Self-assessment questions

Q1: A line of response or LOR is:
   1. A line passing through the annihilation point
   2. A line defined by a pair of detectors
   3. A line passing through the point of positron emission
   4. A line a pair of annihilation photons flying along

Answer: 2

Q2: Among these the isotope with the shortest positron range is:
   1. $^{18}$F
   2. $^{11}$C
   3. $^{15}$O
   4. $^{68}$Ga

Answer: 1

Q3: The contribution of photon non-collinearity to the PET spatial resolution is:
   1. Proportional to the scanner diameter
   2. Proportional to the average kinetic energy of the positron
   3. Proportional to crystal thickness
   4. Proportional to crystal pitch

Answer: 1

Q4: Which scintillating material is now the most widely used in PET detectors?
   1. NaI
   2. CsI
   3. LYSO/LSO
   4. BGO

Answer: 3

Q5: BGO is better that LYSO/LSO in:
   1. Light yield
   2. Decay time
   3. Energy resolution
4. Photofraction at 511 keV

Answer: 4

**Q6: Parallax error - Which statement is not correct?**

1. Its contribution to the spatial resolution increases when thicker crystals are used
2. Its contribution to the spatial resolution increases for PET with larger bores
3. Its contribution to the spatial resolution is almost negligible at the center of the FOV
4. When relevant, the parallax error causes a radial elongation of point sources

Answer: 2

**Q7: The contribution due to the finite crystal pitch d to the spatial resolution is proportional to:**

1. \(d^2\)
2. \(d/2\)
3. \(1/d^2\)
4. \(1/d\)

Answer: 2

**Q8: The coding error is associated to the capability of the system to:**

1. Measure the position of the annihilation point
2. Measure the energy released in the scintillator
3. Identify in which crystal the interaction occurred
4. Estimate the depth of interaction within the scintillator

Answer: 3

**Q9: PMT-APD comparison - which statement is correct?**

1. PMTs are faster than APDs
2. PMTs have a higher quantum efficiency than APDs
3. APDs have a better temperature stability than PMTs
4. Both photodetectors are compatible with magnetic fields

Answer: 1

**Q10: SiPMs are superior to APDs in:**

1. Compatibility with magnetic fields
2. Gain
3. Compatibility with LSO
4. Spatial resolution

Answer: 2