A natural question to ask is whether we can characterize geometrically the classes in homology that are Poincare dual to classes in one of these factors. For example, we say a homology class $\gamma \in H_{2p}(M, \mathbb{Z})$ is analytic if it is a rational linear combination of fundamental classes of analytic subvarieties of M; dually we say a cohomology class is analytic if its Poincare dual is.

Now, we have seen for purely local reasons that if $V \subset M$ is an analytic subvariety of dimension q and ψ any differential form on M,

$$\int_V \psi = \int_V \psi^{n-p,\, n-p}.$$

[[See P23 for notation and P32 for evidence , $V \subset M$ is an analytic subvariety of dimension $n-p$ and ψ any differential form on M.]]

Thus if η is the harmonic form on M representing the cohomology class η_V and ψ any harmonic form,

$$\int_M \psi \wedge \eta = \int_V \psi = \int_V \psi^{n-p,\, n-p} = \int_M \psi \wedge \eta^{p,p}.$$

i.e. $\eta = \eta^{p,p}$, and so we see that any analytic cohomology class of degree $2p$ is of pure type (p,p).

[[$\int_M \psi \wedge \eta = \int_V \psi = \int_V \psi^{n-p,\, n-p}$. see P59.