We also add self interactions of the extra scalar field ρ, described by the potential

$$V(\rho) = -\frac{\mu^2}{2}\rho^2 + \frac{\lambda}{4}\rho^4, \tag{83}$$

whereupon the field ρ acquires a VEV $\tilde{v} = \frac{\mu}{\sqrt{\lambda}}$ and a mass $m_h = \sqrt{2b(\pi R)}\mu$. We then expand as usual:

$$\rho = h + \tilde{v}; \tag{84}$$

in this way the Lagrangian is equal to that of eq. (8) plus kinetic, mass and interaction terms for h. The interactions between h and the gauge bosons help unitarizing the scattering of the longitudinally polarized vectors, and the unitarity violation is postponed to the scale typical of a 5D theory, Λ'.

In the GD-BESS case, the presence of a physical scalar was undesirable since it seemed to reintroduce the hierarchy problem. In the continuum limit, however, at least for a particular choice of the extra-dimensional background, the slice of AdS_5 that we will analyze in section VI B, the h field can be interpreted as a composite Higgs state - just as the KK excitations of the gauge bosons - by the AdS/CFT correspondence [7, 63, 64, 70], sidestepping the hierarchy problem.

VI. PHENOMENOLOGY

In this last section, we are going to do a brief phenomenological study of the continuum GD-BESS in correspondence of two particular choices for the warp factor $b(y)$: the *flat limit*, $b(y) \equiv 1$ and the *RS limit*, $b(y) = e^{-2ky}$. In both cases, we will report spectrum examples, bounds from electroweak precision tests and naive unitarity cut-off.

A. Flat extra dimension

In this case, we have $b(y) \equiv 1$. This immediately implies (using eq. (62))

$$\bar{M} = \frac{\sqrt{3}}{\pi R}. \tag{85}$$

To get an interesting phenomenology at an accessible scale, we need $\bar{M} \sim$ TeV. The basic parameters of the model are πR, the gauge couplings g_5, $\tilde{g}$ and $\tilde{g}'$, the VEV of the scalar field $\tilde{v}$ (which is $\equiv v$ since $b = 1$) and its self-coupling constant λ. The latter is only used