the new generation of stereoscopic arrays of Imaging Atmospheric Cherenkov Telescopes will do it. Good perspectives within Latin America for the installation of new γ-ray observatories are to be explored. A step in this direction is given with the ongoing construction of HAWC (see Gonzalez 2011).

2. BINARIES: HE AND VHE SOURCES

Gamma-ray binaries constitute a uniquely valuable, (still small) population of HE and VHE sources. There are three confirmed galactic High Mass X-ray Binaries (HMXBs) with persistent TeV emission: PSR B1259-63, LS 5039 and LSI +61 303 (Aharonian et al. 2005a; Albert et al. 2006; Aharonian et al. 2005b) plus a recently proposed candidate (HESS J0632+067, Hinton et al. 2009); and a flaring one at VHE: Cygnus X-1 (Albert et al. 2007). Cygnus X-3 has been detected in the HE band though not at VHE[4] (Tavani et al. 2009). They have all been detected by Fermi and/or AGILE satellites at $E > 100$ MeV, and have deserved extensive and individual studies. Paredes (2011) presents a summary on their properties and further references.

The nature of the compact star can be crucial to establish the γ-ray production scenario in a binary. In the pulsar wind nebula case the massive star wind collides and confines the relativistic pulsar wind in a collimated outflow, a comet-like structure accompanying the pulsar along its orbit. Particles accelerated at the termination shock then produce the non-thermal emission (Maraschi & Treves 1981; Dubus 2006a). Such is case for PSR B1259-63, but the sketch is very different for microquasars (MQs) as are Cyg X-1 and Cyg X-3. LS 5039 and LS I +61 303 (Romero et al. 2007) are unclear in this sense.

In high-mass MQs the compact object accretes matter from the stellar wind, and redirects part of the accretion power to launch collimated (mildly) relativistic outflows. The matter content of those microquasars jets is unknown: a relativistic electron population is responsible for the synchrotron radio emission along the jets which is the peculiarity defining MQs (Mirabel & Rodríguez 1998), and, in the case of SS 433 the iron X-ray line observations have proved the presence of ions in the jets (Kotani et al. 1994).

Leptonic and hadronic relativistic populations may arise as the result of particle diffusive acceleration at shocks inside the jet itself, recollimating shocks or medium shocks (see e.g. Bosch-Ramon 2010), but other acceleration processes, related to magnetic reconnection for instance, can be effective as well. Typically the injection of particles with a power-law distribution in energies can be expected, extending up to values many order of magnitude above the rest mass energy. More generally speaking, the cut-off depends on the competing processes that, together with the acceleration, simultaneously act making the particle to lose energy (i.e. radiative processes), or removing them from the acceleration region (i.e. diffusion and/or advection). The particles radiate by their interaction with the ambient fields: magnetic, matter field, soft photons. The output of any radiative process can be computed once the (time-dependent) distribution of particles is known, and such distribution is to be inferred from the injected one by solving the transport equation under appropriate assumptions (see e.g. Aharonian 2004; Bosch-Ramon et al. 2006, and references).

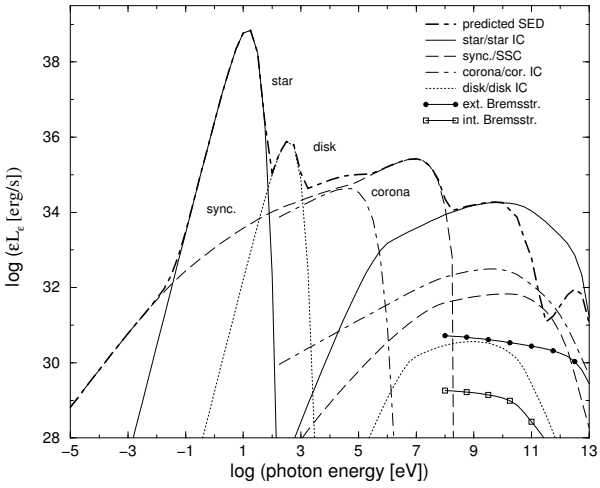

Fig. 1. Spectral energy distribution computed for a HMMQ (from Bosch-Ramon et al. 2006). The predicted total SED, summing up all the contributions is affected by absorption in the photon field of the star.

Many contributions, involving primarily injected and secondary particles, i.e. the byproduct of interactions or decaying primaries, collaborate the final Spectral Energy Distribution (SED), as shown in the example Figures 1 and 2. These predicted SEDs also illustrate (a) the broad extension in energies (at least 14 orders) that characterize γ-ray binaries, and (b) the strong influence of high-mass star, with its intense photon field, on the emerging SED. The reader is directed to Bosch-Ramon, Romero, & Paredes (2006) where the details on the calculation are properly discussed. It is worth to notice that a relatively large number of parameters are involved in this kind of models due to the many physical pro-

[4]Similar can be said about Eta Carinae, but this is a rather different case; a binary of massive stars.